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THE HISTORY
OF THE
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NATURAL HISTORY DEPARTMENTS
OF THE
BRITISH MUSEUM

VOL. II.—APPENDIX.

GENERAL HISTORY OF THE DEPARTMENT OF ZOOLOGY
FROM 1856 TO 1895

BY

DR. ALBERT GÜNTHER, F.R.S.

Formerly Keeper of the Department of Zoology

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P R E F A C E.



FOR the preparation of this Appendix to Volume II. of the "History of the Collections" the Trustees of the British Museum are indebted to Dr. A. Günther, F.R.S., formerly Keeper of the Department of Zoology. It is a valuable record of the development of the zoological section of the British Museum from the year 1856 to the year 1895, when Dr. Günther retired from the service of the Trustees. Before 1856 the zoological section had been, for the purposes of administration, the zoological "Branch" of the "Natural History Department" of the British Museum.

The Index has been made by Mr. G. J. Arrow, Assistant in the Department of Zoology.

L. FLETCHER,
Director.

BRITISH MUSEUM (NATURAL HISTORY),
LONDON, S.W.,
June 22nd, 1912.

CONTENTS.

1856-61.

	PAGE
Study-series and Exhibition-series	2
Condition and Location of the Collection in 1856	2
Exhibition-series	2
Study-series	4
Mammalia and Osteological Collections	4
Birds	4
Reptiles, Batrachians and Fishes	5
Mollusca	5
Polyzoa and Crustacea	6
Arachnida, Myriopoda, Xiphosura	7
Insects	7
Other Invertebrates	8
Staff of the Department	9
Permanent Staff	9
(Dr. J. E. Gray—Mr. G. R. Gray—Mr. A. White—Mr. F. Smith—Dr. W. Baird—E. Gerrard—J. Saunders.)	
Auxiliary Staff	10
Lists and Catalogues	11
Growth of the Collection	13
(Collection of East India Company—J. K. Lord—B. H. Hodgson Collection—Sources of information.)	
Grants for annual expenditure	15

1862-69.

Condition of the Collection	16
(Osteological Collection of Mammals—Snakes—Fishes—Shells.)	
Staff of the Department	17
(Dr. A. Günther—Mr. A. G. Butler—Mr. A. W. E. O'Shaughnessy—Mr. C. O. Waterhouse—Mr. E. A. Smith.)	
Lists and Catalogues	18
Growth of the Collection	18
(Bowring Collection—Cuming Collection.)	
Grants for annual expenditure	21

1870-74.

Changes in the Staff	22
(Dr. Gray's illness—Assistant Keepers—Death of Dr. Baird and Mr. G. R. Gray—Mr. E. J. Miers and Mr. R. B. Sharpe.)	
Arrangement of the Collection	22
(<i>Buprestidæ</i> —Mr. Butler commences Moths.)	

	PAGE
Lists and Catalogues	24
(Catalogues of Chiroptera and Birds.)	
Growth of the Collection	26
(Wallace Collection of Birds—Beddome Collection of Indian Reptiles— <i>Ceratodus</i> —Mrs. Gray's Collection of Shells—Moggridge Collection—Saunders Collection of Buprestidæ—Brenchley Collection—Mr. Blanford's Persian Collection.)	
Grants for annual expenditure	29
The New Museum	29

1875-78.

Arrangement of the Collection	30
(Exhibition of British Nesting Birds—"Transit of Venus" Collections—Dr. Brüggemann's work on Corals—Mr. Carter's work on Sponges.)	
Catalogues	33
(Catalogue of Birds—Mr. Busk's Catalogue of Polyzoa—Illustrations of types of Lepidoptera Heterocera.)	
Staff	34
(Mr. O. Thomas—Mr. S. O. Ridley—Mr. F. J. Bell.)	
Growth of the Collection	35
("Transit of Venus" Collection—Arctic Expedition Collection—Goodenough Collection—Galapagos Collection—Welwitsch Collection—Godman and Salvin Collection of Eggs—Mr. R. T. Lowe's Collection of Shells—First <i>Challenger</i> Collection—Bowerbank Collection of Sponges.)	
Grants for annual expenditure	38
The New Museum	38
(Cetacean Room—The Northern Galleries—Spirit Building—Mammalian Galleries—Furniture and Fittings—Zoological Library.)	

1879-81.

Changes in the Staff	41
(Death of Mr. F. Smith and Mr. A. W. E. O'Shaughnessy—Mr. W. F. Kirby.)	
Arrangement of the Collection	42
Catalogues	43
Growth of the Collection	44
(Collection of East India Company— <i>Challenger</i> Collections—Gould Collection—Exhibition of Humming Birds—Godman and Salvin Collection of Old-World Birds—Hewitson Collection—Grote Collection—Baly Collection—F. Bates Collection—F. Smith Collection.)	
Census of the Collections	47
Duplicates	47
Students and Visitors	48
Grants for annual expenditure	49
The New Museum	49
Departmental Library	50

1882-83.

	PAGE
Additions to the Staff	51
(Mr. G. A. Boulenger, Mr. W. R. Ogilvie-Grant, Mr. J. J. Quelch —Duties of Attendants.)	
Arrangement and Catalogues	52
Growth of the Collection	52
(Collection of Batrachians—International Fisheries Exhibition —Zeller Collection of Lepidoptera—Mr. J. Abbot's and General Hardwicke's drawings.)	
Duplicates	54
Grants for annual expenditure	55
Departmental Library	55
(Temporary employment of Mr. J. E. Harting.)	

THE REMOVAL AND REARRANGEMENT.

(1882-84.)

The Removal.	55
Rearrangement	57
Osteological Gallery and Cetacean Room	57
Mammalian Gallery.	58
Bird Gallery and Bird Room	58
Reptile Gallery and Fish Gallery	59
Shell Gallery, Insect Gallery and Starfish Gallery	60
Coral Gallery, British Room and Insect Room	61
Spirit Building	62
Zoological Library, &c.	62

1884-85.

Guides and Catalogues	63
(Alert Report.)	
Growth of the Collection	64
(Hume Collection of Birds—Godman and Salvin Collection of the Birds of Central America.)	
Addition to the Staff	66
(Mr. R. I. Pocock.)	
Grants for annual expenditure	66
Students	66

1886-87.

Arrangement of the Collection	67
(Labels.)	
Staff	68
(Mr. C. J. Gahan, Mr. R. Kirkpatrick.)	
Growth of the Collection	69
(Sir J. Murray's Collection of the Scotch marine Fauna— Tweeddale Collection of Birds and Library—Increase of Collection of Lizards—Walsingham Collection of Larvæ of British Lepidoptera—Godman and Salvin Collection of Central American Coleoptera.)	

	PAGE
Catalogues, Guides and Descriptive Papers	71
Departmental Library	72
Duplicates	73
Grants for annual expenditure	73
Students	73

1888-89.

Inadequacy of Space and Staff	73
(Increase cannot be checked.)	
Additions to the Staff	75
(Mr. F. A. Heron and Mr. E. E. Austen.)	
Growth of the Collection	75
(<i>Challenger</i> Collections (continued)—Mr. Godman's donation of North American Birds—Riocour Collection—Day Collection of Fishes and Crustaceans—Turton Collection of Shells— Hampson Collection of Nilgiri Lepidoptera.)	
Arrangement of the Collection	76
(Mr. Thomas' Catalogue of Marsupialia, etc.)	
Guides and Catalogues	77
Duplicates	77
Grants for annual expenditure	77
Students	78

1890.

Arrangement of the Collection	78
(Auxiliary Workers.)	
Catalogues	78
Growth of the Collection	78
(<i>Challenger</i> duplicates—Keyserling Collection of Arachnida— Frey Collection of Lepidoptera—Baly Collection of Coleop- tera—Mr. Carter's Collection of Fresh-water Sponges.)	
Duplicates	80
Grants for the year	80
Students	81

1891-92.

Supplementary buildings	81
(Iron shed for Whales.)	
Arrangement of the Collection	82
(Arrangement of Birds' Eggs—New edition of Catalogue of Fishes—List of Entomological types—Professor Parker's Foraminifera.)	
Catalogues	83
(Instructions for collecting.)	
Growth of the Collection	84
(Hume Collection of Heads and Horns—Dr. Blanford's Indian Mammals—Mr. Littledale's Caucasian Collection—Dr. Anderson's Egyptian Mammals—Whale skeletons—Godman	

and Salvin Collection of Central American Birds and Beetles (continued)—Gorham Collection of Endomychidæ—Moore Collection of Indian Lepidoptera—Green Collection of Ceylonese Moths—Atkinson and Watson Collections of Indian Insects—Amber Collection—Parker Collection of Foraminifera.)	
Duplicates	86
Grants for annual expenditure	86
Students	86

1893.

The Spirit Building enlarged (Death of Mr. G. Brook.)	87
Arrangement of the Collection	87
Guides, Catalogues and Descriptive Papers (Catalogue of Snakes and of Madreporaria.)	88
Growth of the Collection (Pascoe Collection—Stainton Collection—J. J. Walker and P. W. Bassett-Smith Collection—Sir H. H. Johnston's Collection from Nyassa—Dr. J. W. Gregory's Collection from Central Africa—Godman and Salvin Collection of Central American Birds (continued)—Morelet Collection of Shells.)	89
Duplicates	91
Grants for the year	91
Students	91

1894-95.

Arrangement of the Collection (Iron shed for Cetaceans—Oates Collection of Arachnida—Noc- tuidæ—Mr. G. F. Hampson—Mr. H. M. Bernard.)	91
Catalogues	95
Growth of the Collection (Shelley and Godwin-Austen Collection of African and Indian Birds—Moore Collection of Indian Lepidoptera—Godman and Salvin Collection of Central American Insects (con- tinued)—Saville-Kent Collection of Australian Corals.)	95
Census of the Collection	97
Duplicates	97
Departmental Library	97
Grants for annual expenditure	98
Students	98
INDEX	99

1856-1861.

The year 1856, in which the "Zoological branch of the Natural History Department" became a separate Department, marks the commencement of a new era in its development under Dr. Gray's Keepership. In the sixteen years during which he had held this office, these collections had made such progress, as regards growth and arrangement, that the British Museum could well hold its own in a comparison with the most renowned and older institutions of the Continent. These latter may have excelled in one or more respects, such as the fuller representation of certain faunas or orders of animals, or the possession of the original material on which the older standard works were based; but the riches of the British Museum were more evenly distributed over the whole range of the animal kingdom, and, as far as the Indian and Australian Faunas were concerned, the British Museum was, of course, *facile princeps*. Donations always formed a large, generally the larger, proportion of the annual increase of the collections, and as, for obvious reasons, Birds, Shells, Insects—especially Lepidoptera and Coleoptera—were the groups most popular with collectors, they invariably preponderated. The reception of an annual separate grant of money for purchases greatly assisted in regulating this uneven increase: compared with more recent years, this grant must be regarded as very liberal; from 1837-46 it averaged about £1100 per annum, and rose to £1500 about the period under consideration. The selection of the purchases offered during the year was left entirely to the judgment of the Keeper (subject to the sanction by the Trustees), and he was thus enabled to direct the main expenditure temporarily to any branch of the collections which most needed it, effecting thereby greater uniformity in their growth.

The divergence in the use of the collections by the general public, and by the select class of students, was indicated already in Sir Hans Sloane's will when he directed that his collection should "be maintained, not only for the inspection and entertain-

1856-1861. ment of the learned and the curious, but for the use and general benefit of the public." To attain this twofold object, Dr. Gray perceived at an early period that it would be desirable to form a *study-series* as distinct from the *exhibition-series*, and in the Parliamentary Return for 1858, p. 16, he refers to the formation of both series as being in progress. At the present time one can hardly realise that he had to carry out so beneficial, indeed, so necessary, a measure in the face of considerable opposition by persons who referred to the great Continental Museums, in which, at that time, every specimen was on exhibition. However, he had an unanswerable argument in the disproportion of the magnitude of the zoological collections and the limits of the space available for exhibition.

THE CONDITION AND LOCATION OF THE COLLECTION IN 1856.

The galleries and rooms assigned to the Zoological Department for *exhibition* contained nearly 30,000 superficial square feet; all were lighted from the top. They were furnished with tall cases along the walls, and with table-cases occupying the centre of the floor.* A saloon and two adjoining rooms, 35 feet wide and of an aggregate length of 200 ft., were given to the Mammalia, all of which were exhibited in wall-cases, with the exception of the largest specimens, which were placed in a central group on the floor, without any protection. In the table-cases of these rooms Corals and Sponges were shown. The finest and best-lit of the galleries, 300 ft. long, was given up to the two most popular parts of the exhibition, Birds and Shells, the former occupying about 900 ft. of wall-cases, the latter two rows of table-cases. In smaller rooms selected series of Insects and other Articulata, and a number of stuffed Fishes and Reptiles (especially Tortoises) were exhibited, whilst finally a room, 90 ft. by 25 ft., was reserved solely for a representation of the British Fauna.

The majority of specimens of Mammals and Birds were fairly mounted, in the usual style of the bird-stuffer of the first half of last century, but there were very few examples of taxidermic art among them, while the Reptiles and Fishes were scarcely more than dried skins. All were mounted on light-coloured highly-polished sycamore stands, the use of which had been adopted by Dr. Gray after long experience; they offered the great advantage that they could be easily kept free from dust or other impurities, while

* See plans attached to the Report of the Select Committee on the British Museum, August 10th, 1860.

painted stands, or (still worse) stands imitating rock or soil, 1856-1861. sooner or later became regular dust-traps. The name of the animal, the locality where it was obtained, and, if presented, the name of the donor, were painted by hand on the stand in bold letters which could be read without difficulty from a distance.

The guiding principles in the formation of an exhibition-series as distinct from a study-collection, as well as from a strictly educational series, were not uniformly followed in the various divisions. Nor was this possible at that time and under the conditions then existing, even if they had been fully understood at the time. Thus the Mammalian cases became unduly crowded; examples of large size, for which no room could be found in store-rooms, were mounted and placed in the galleries, and in some of the cases even the systematic order had to be abandoned. Among the Birds, which were relatively liberally provided with exhibition-space, more specimens had been mounted than were needed even by an intelligent visitor. The exhibition of Reptiles and Fishes was defective in every respect. For the collection of Shells the accommodation was ample, and the series sufficiently complete and systematically arranged to satisfy, not only the casual visitor, but also the large class of collectors who pay frequent visits to the gallery with the object of comparing their unnamed specimens with those in the Museum. With regard to Insects, nothing approaching a complete systematic representation of the higher groups was attempted: a series of showy and remarkable forms were shown, and when faded by exposure to light, were replaced by others; they were arranged in table-cases, while a considerable number of nidamental structures were placed in the wall-cases close by. As regards the whole host of "Lower animals," specimens which happened to be suitable for exhibition were placed in or on the table-cases, as long as there was space for them, and, finally, the British collection was very incomplete, and only occasionally attended to.

In spite of the defects indicated, the collections, as a whole, impressed not only ordinary visitors, but also experts, as an imposing exhibition worthy of the Museum of a nation with the greatest colonial possessions in the world. Its generally orderly arrangement in well-made cases, the clean and well-preserved specimens, the richness in scarce and striking types of animal life, the spacious and well-lighted galleries, were all points in which this exhibition compared most favourably with other institutions on the Continent; and every credit is due to the staff of the Department, and particularly to its Keeper, for having

1856-1861. raised the collection to such a high level in the comparatively short period of about twenty years. But the exhibition itself was, or soon became, only a secondary consideration in Dr. Gray's aims; the instruction, or rather the amusement (an expression constantly occurring in the evidence before the Select Committee of 1860), of the public occupied his care much less than the direct advancement of science. In the "Guide" which he prepared for the public he was content with giving very elementary and fragmentary information, while he concentrated his efforts on the preparation of nominal or descriptive systematic catalogues, and in the formation of separate study collections.

The condition of these *study-series* about this period was as follows:—

1. The unmounted Mammalian skins formed about one-fourth of the whole collection (mounted and unmounted); they were kept in the basement in rough cupboards, each of which would hold about two or three skins of animals the size of a donkey, smaller specimens being arranged on open trays.

2. Much more extensive and of greater intrinsic value was the collection of skulls and skeletons; it was entirely the creation of Gray, who, without accurate anatomical knowledge, was one of the first systematists to utilise osteological characters for distinction of the species and genera of living forms. This collection occupied a room in the basement, 65 feet by 35 feet, fitted with wall- and table-cases. No ray of the sun ever penetrated into this locality, and a fire had to be kept in it all the year round to preserve the bones from damp and mould. No more unsuitable locality could be imagined for an osteological collection, yet it was the only room in the building available for the purpose. Nearly all the skeletons were kept disarticulated in boxes, thus requiring but little space, and being conveniently arranged for study. One or two of the cases were occupied by bones of birds, reptiles, and some fishes. The whole collection was, from the beginning, in excellent order of arrangement, the specimens being carefully named and labelled; it was throughout under the special care of the chief Attendant of the Department, Mr. *Edward Gerrard*, who prepared a nominal list of the collection in 1862.

3. The collection of Birds was, with regard to numbers, about equally divided between the mounted and unmounted series. As in Mammalia, the size of a specimen frequently decided its reference to either of the two series. The skins were kept in wooden boxes of a convenient size, each being capable of

holding some eighty skins of birds of the size of a sparrow. The 1856-1861. boxes filled wall-cases in and outside the Ornithologist's room, and although convenient of access to the Assistant in charge of the collection, there was scarcely room for a visitor or worker who wished to consult it. However, it was well arranged and named, and *G. R. Gray* had prepared a MS. list, which, however, was never published.*

4. Reptiles, Batrachians, and Fishes.—The bulk of these collections was preserved in spirit, and kept in three rooms of the basement, aggregating a length of 110 feet with a width of 17 feet. The bottles were packed on the shelves of high wall-cases as closely as possible. The conditions of light and temperature were most suitable for the preservation of the specimens, but less so for the comfort and health of the persons compelled to work in that locality.† The Chelonians, Saurians, and part of the venomous Snakes had been catalogued by Dr. Gray, and therefore were in orderly arrangement and named, with the exception of the numerous additions, which soon exceeded the specimens catalogued. The remainder of the collection was stowed away without any attempt at arrangement, and although some historical collections of Fishes, like those of *W. Yarrell*, *R. Parnell*, *Sir J. Richardson*,‡ etc., had been deposited in the Museum, only a small proportion bore the names given by the authors. At the beginning of this period (1858) the Reptiles and Batrachians numbered about 7000, and the Fishes about 16,000 specimens.

5. Exigencies of space rather than the adoption of a distinct principle led from an early period to the formation of a study-series in the rapidly growing collection of Mollusca. This series occupied then, as it does now, the drawers of the table-cases, in the glazed tops of which were arranged the very liberal exhibition series. The mode of preservation of the shells was not satisfactory; the specimens were gummed on tablets, generally

* His "Handlist" is an enumeration of species, not of specimens.

† One of the numerous springs which in former years supplied many houses in Bloomsbury with excellent water made its presence below the floor of the spirit-rooms felt in a very inconvenient manner: the stone-flags of the floor were at times covered with damp or water, causing the wood-work at the bottom of the cases to rot, and destroying unfortunately many of the labels on the bottles—a serious injury which had to be checked by adopting the plan of painting the labels in oil-colours.

‡ The zoological collection at the Haslar Hospital, which contained the Fishes of the voyage of the *Erebus* and *Terror*, as well as other types, was transferred to the Museum in 1855; the specimens arrived without labels and many were in a very bad condition, as for economy's sake a solution of chloride of zinc had been used instead of alcohol!

1856-1861. occupying considerably more space than was justified by the size of the shells, and exposing the specimens to deterioration by dust and the gum applied to them; this mode was abandoned by Dr. Gray's successor, who introduced the use of glass-topped boxes of various sizes, but multiples of a certain unit. They are adapted for specimens of any but very large size, and a great economy of labour and space was effected by this method. A very small number, especially Cephalopods and Pteropods, were preserved in spirit. The whole collection of Mollusca (exhibited as well as in store for study) may be estimated to have been about 50,000 in the year 1856.

The general arrangement of the collection was maintained in a fair state of efficiency, but the naming of the specimens could not be kept up with their increase in a uniformly satisfactory manner, especially as Dr. Baird's time was chiefly occupied in mounting the new arrivals. However, the acquisition of some important historical collections, like that made during the voyage of H.M.S. *Sulphur*, Webb and *Berthelot's* from the Canaries, *MacAndrew's* and *Gwyn Jeffreys'* from the Mediterranean and Atlantic Coasts, *Ramon de la Sagra's* from Cuba, *Chitty's* from Jamaica, *D'Orbigny's* from South America, *Eydoux* and *Souleyet's* from the voyage of the *Bonite*, and particularly Gray's systematic labours on some of the families or on numerous miscellaneous additions, introduced a large proportion of named specimens into the collection. Quite a series of small catalogues and lists of various groups of Mollusca were published by the Trustees under Gray's authorship, or by his initiative and under his supervision, between the years 1849 and 1857, but they were unequal as regards scope and plan, and remained merely fragmentary attempts at cataloguing the collection.

6. For the arrangement of the *Polyzoa* Dr. Gray enlisted the help of *George Busk*, who commenced a descriptive catalogue of the marine species in 1852. This was for a very great proportion based upon materials in Busk's private possession, but all of them, with the microscopic slides prepared by him, were transferred to the Museum at a much later date.

7. No separate study-collection worth mentioning of *Crustacea* existed in 1856 and for some years afterwards, and it seems that this want of material was the cause of the abandonment of a "Catalogue of Crustacea," of which one part only appeared (1855), *T. Bell* being the author. *A. White* had to name the specimens in the Museum, and whilst engaged in this work he

prepared a list of Crustaceans and another of the British species, 1856-1861. but both of them were compiled from other works rather than based upon the collection in the British Museum.

8. *Arachnida, Myriopoda, Xiphosura*.—Large conspicuous forms like the King-Crabs, Mygales, large Scorpions, and large Myriopods were named and exhibited in the galleries, but very little attention had been paid to the arrangement of the remainder, which were kept dried in a cabinet in the Insect Room. Such as were preserved in spirit were mixed up with unnamed insects in one of the store-rooms. No systematic attempt was made at reducing them to order or at forming a satisfactory collection, with the exception of the Myriopods; for these Dr. Gray had secured the assistance of *G. Newport*, who in 1844 prepared a preliminary list, afterwards (1856) enlarged into a descriptive catalogue. Unfortunately the death of the author interrupted the progress of the work, which thus remained limited to the *Chilopoda*.

9. Practically the whole of the entomological collection was reserved for study. It was kept in a large room—the Insect Room—a well-lighted apartment fifty feet by thirty feet, in which the cabinets were arranged along the walls or in rows intersecting the body of the room, so as to divide it into several partitions. This was also the principal work-room of the Department, in which not only the men directly engaged upon the entomological collections were placed, but also other Assistants and any visitors or students requiring assistance from some member of the staff. In the annual returns to Parliament on the progress of the collections Dr. Gray's reports were not detailed enough to allow an estimate to be given of the actual extent of the collection of Insects at this period, but it had attained sufficient proportions to fill this large room; the twenty-drawer cabinets, of which eight or ten were supplied each year, being piled on the top of the old ones almost to the ceiling. While as regards completeness or arrangement it was probably excelled in every branch by other foreign or private collections, it was evident that it had outgrown the working power of the two entomological Assistants. A glance through the pages on which subsequently some of the principal additions incorporated in this collection are mentioned will show its immense intrinsic value, which grew from year to year. Although the Keeper, Dr. Gray, made every effort within his means to have the specimens named, arranged, and catalogued, the annual accessions necessitated constant rearrangement, and arrears already began to accumulate. Yet by the combined work of the entomological

1856-1861. Assistants and of the outside experts who had been engaged by Dr. Gray, the various divisions were about this time in an orderly state of arrangement, as shown by the series of catalogues published by the Trustees. The whole of the *Coleoptera* and *Orthoptera* were generally arranged, and of many of the families Catalogues were published. The *Hymenoptera* were F. Smith's speciality, and received his constant authoritative attention. The *Rhopalocera* had been arranged by E. Doubleday and G. R. Gray, the *Heterocera* by F. Walker* (1853-66), the British species by J. F. Stephens and H. T. Stainton, the *Neuroptera* and *Diptera* by Walker (1848-55), the *Rhynchota* by Walker and W. S. Dallas. The *Aptera* received no attention after Henry Denny's original collection of British *Anoplura* had been acquired in 1852.

10. As regards the remainder of invertebrate animals study-series systematically arranged were non-existent. Some very important materials had been acquired as occasion offered, foremost among them the specimens described by Dr. G. Johnston in his "British Zoophytes." Other remarkable specimens of corals and sponges were sporadically described by Dr. Gray. He had also contemplated working systematically through at least the British species of Echini and Sponges, but the attempt was abandoned by him as early as 1848. And finally the acquisition of a series of Entozoa from Prof. C. T. von Siebold led to the publication of a Catalogue of Intestinal Worms, to which, however, only a certain ephemeral interest was attached. The specimens, preserved in spirit, have much deteriorated.

* Walker's work has been severely criticised by many competent specialists, and it must be admitted that some of it is not creditable to the institution. He worked in a purely mechanical fashion, without grasp of the subject or principles of classification; he noted the most superficial characters, using some of them for specific, and the more conspicuous for generic distinctions; the obvious consequence of this method of work was that he not rarely described the same insect under two or more different names. His earlier work, however, is much more reliable than that of later years when his eyesight began to fail. Although Dr. Gray had become aware of the imperfections of Walker's work, he continued to employ him during the whole time of his Keepership, as the mass of materials were reduced at least to some sort of order, Walker being an indefatigable worker, who, in fact, could not be replaced. Moreover, I have heard entomologists who were collecting and working abroad give their unqualified praise to Walker's catalogues as the only available guide to which they could look for assistance in their own studies.

THE STAFF OF THE DEPARTMENT.

(1856-61.)

The staff on which the care of these collections and the work **1856-1861.** on them devolved, consisted of—

1. The *Keeper*, Dr. J. E. Gray, the responsible head, whose duties were in the first place administrative. He attended to the whole of the official work and correspondence, availing himself to a very limited degree of clerical help by the Assistants. He directed the work of the Assistants and superintended its progress, supervising all the details connected with the acquisition of additions and their distribution in the exhibition or study-series. He, besides, undertook the systematic work on the Mammalia, on the greater portion of the Reptilia and Amphibia, on certain portions of the Mollusca and Echinodermata, and on the more important acquisitions of Radiated animals. The Catalogues and exceedingly numerous papers in various periodicals prepared by him are the evidence of his indefatigable zeal for the development of his Department.

2. Four *Assistants*, the senior of whom, G. R. Gray, attended to the collection of Birds. Two others, Adam White and F. Smith, were in charge of the entomological collections, including Crustacea, Arachnida, and Myriopoda, while the fourth, W. Baird, had a severe struggle to keep abreast with the preservation of the Molluscs and the whole host of Lower animals, as well as with the preliminary work of registration and labelling of the additions to these divisions.

3. The majority of the *Attendants* were employed on the service of cleaning and guarding the public galleries, but two should be specially mentioned as most useful helps to the officers of the Department. Edward Gerrard possessed a most intimate acquaintance with the specimens of Vertebrate animals, except birds. He performed the curatorial duties connected with the Mammalia in the galleries and store-rooms, and with all the specimens preserved in spirit, attended to their registration, and was finally entrusted by Dr. Gray with the preparation of a list of the osteological specimens of Mammals. John Saunders acted as special Attendant of the Keeper, who employed him in much clerical work, for which he possessed a special aptitude. He took care of the small zoological library, of which he prepared a MS. list, and acquainted himself so well with the literature, that

1856-1861. he was able to supply every book required from the Great General Library. No taxidermist or articulator was attached to the staff; the work of preparing or mounting skins and skeletons was done outside the Museum by private persons.

To supplement in some measure the inadequate working strength of his staff, Dr. Gray availed himself of the temporary services of a number of specialists who seemed to him particularly qualified to undertake the arranging and cataloguing of certain parts of the collection. In the period 1856-61 the following were thus engaged by the Trustees:—

Dr. A. Günther commenced his work in the Museum in 1857, and was at first employed for the continuation of the Catalogue of Reptiles and Batrachians: that work he completed in 1858. He then undertook the general Catalogue of Fishes, Dr. Kaup (who had previously worked at the Lophobranchs and Apodal Fishes) being unable to give the time requisite for so great an undertaking; the eight volumes of this catalogue occupied the next twelve years, three appearing within the period 1856-61.

In Mollusca, Dr. Gray obtained some help from Dr. L. Pfeiffer and Dr. P. P. Carpenter; the latter prepared the Catalogue of the Mazatlan Collection presented by him in 1857; the catalogue was published by the Trustees in the same year.

Mr. C. Spence Bate was during this period engaged on a Catalogue of Amphipodous Crustacea, which was published in 1862. Probably the author's private collection was considerably richer than that in the British Museum, and the value of the catalogue as a record of a named and well-arranged collection is still more impaired by the author's want of care in labelling the types of his descriptions.

In 1856 G. Newport's first (and only) part of a Catalogue of Myriopoda was published, leaving the Chilopoda in a fair state of arrangement.

As regards *Coleoptera*, Dr. Gray seems to have had difficulty in finding an entomologist who would undertake more than the arrangement of some family in which he was specially interested at the time; thus he engaged for the *Cassididæ* the help of Prof. C. H. Boheman (Cat. 1856), for the *Hispidæ* Dr. J. S. Baly (Cat. 1858), and for some groups of *Halticidæ*, the Rev. Hamlet Clark (Cat. 1860). T. Vernon Wollaston prepared a catalogue (1857) of his Madeira Collection of *Coleoptera* which had been acquired for the Museum.

Mr. *F. Walker* made great progress with the arrangement of 1856-1861. Lepidoptera Heterocera, not less than seventeen parts (7-23) of his catalogue being published. —

Of a catalogue of Orthoptera only one part (*Phasmidæ*) was prepared by Prof. *J. O. Westwood* (1859). The monograph was most profusely illustrated, and the cost of its production was prohibitive (at that time) to the continuation of the catalogue.

Dr. *H. Hagen* revised the *Termitina* (1857); this small part was intended to be the first part of a new edition of the "Catalogue of Neuroptera" prepared by Walker in 1852-53, but, like the preceding, was not continued.

For preparation of lists of the British *Curculionidæ* and British *Ichneumonidæ*, Dr. Gray availed himself of the help of *J. Walton* and *Th. Desvignes*.

LISTS AND CATALOGUES.

(1856-61.)

Before completing the references to the publications issued from the Department in 1856-61, it may be useful to introduce some general remarks on the history and character of the Catalogues.

In 1816 *W. E. Leach* had prepared a "Systematic Catalogue of the specimens of the Indigenous Mammalia and Birds that are preserved in the British Museum: with their localities and authorities. To which is added a List of the described species that are wanting to complete the collection of British Mammalia and Birds." It was one of the chief merits of Dr. Gray's administration that he not only revived this effort in the third year of his Keepership, but that he gave unremitting attention to the systematic cataloguing of the contents of his Department, and to the publication of the catalogues. Under his fostering care the Zoological Department was, and for many years remained, in this respect far ahead of the other Natural History Departments. In recommending to the Trustees the preparation of catalogues for publication, Dr. Gray had to be careful to present them in an inexpensive form such as would not materially add to the growing annual expenditure of the Department, and would allow of their being freely distributed among zoologists and kindred institutions. Besides, the selling

1856-1861. price was fixed so near the cost of production that scarcely any return of the expenditure could be expected from their sale. They were of small extent, and, at first, uniformly printed of 12° size. Several years elapsed before, for some of them, a larger size and illustrations could be used. When the number of persons engaged upon the catalogues increased, and was no longer limited to the staff, considerable latitude was allowed to the authors as regards plan and arrangement of the subject-matter, and it was a pity that the plan adopted by Dr. Gray for the first catalogue prepared by himself in 1843 and entitled a "List of the specimens of Mammalia in the British Museum," was not more strictly and uniformly carried out in succeeding publications. In this List a full enumeration of the specimens in the Museum was given, and it thus retains its value by offering direct evidence regarding the history of many important individual specimens.

Thus these publications differed from one another in several respects :—

1. Some were merely lists of names, with the addition of a more or less complete reference to the previous literature, while in others each species was accompanied by a diagnosis or short description.

2. Either those species only were admitted into the catalogue which were actually represented in the Museum, without reference to, or with but scanty information on, desiderata ; or the catalogue embraced all the species known and rose to the standard of a monograph.

3. Either a list of all the individual specimens in the Museum was appended to each species with a short statement where or from whom each specimen was obtained ; or the species in the Museum were merely marked with the letters B. M.

4. The majority were general catalogues, but others dealt only with the contents of a private collection or the proceeds of an expedition, which had become the property of the Trustees ; and finally many were purely faunistic. The British Fauna especially received Dr. Gray's attention, some 17 parts of a "List of British Animals" being published between 1848-55. This series was never completed, and descriptive catalogues of a higher scientific value, containing much original work, took its place, notably F. Smith's Catalogues of British Hymenoptera and G. Johnston's Catalogue of British Non-parasitical Worms. But this series also soon languished, and received later only one more addition, during Dr. Gray's

successor's Keepership, in F. J. Bell's Catalogue of British **1856-1861**.
Echinodermata.

As the catalogues prepared by means of outside help have already been mentioned, only the following, which were the work of the permanent staff within this period, remain to be enumerated :

Catalogue of the Mammalia and Birds of New Guinea. By J. E. Gray and G. R. Gray. 1859. 12°.

Catalogue of the Birds of the Tropical Islands of the Pacific Ocean. By G. R. Gray. 1859. 12°.

List of the Specimens of Birds—Psittacidae and Columbæ. By G. R. Gray. 1859 and 1856. 12°.

Guide to the Systematic Distribution of Mollusca. Part I. By Dr. J. E. Gray. 1857. 8° (not strictly a Catalogue, and discontinued).

Catalogue of Hymenopterous Insects. Parts 4-7. By F. Smith. 1856-9. 12°.

List of Lepidopterous Insects. Part I. Papilionidæ. By G. R. Gray. 1856. 12° (not continued).

GROWTH OF THE COLLECTION.

(1856-61.)

In these six years close upon 200,000 specimens were added to the collection, with an annual average of 33,200 specimens. By far the larger proportion were donations, and a still larger proportion were Insecta.

The sources whence the most important portions of this increase were derived were the following :—

When it was determined to break up the Museum of the late East India Company, hitherto located in the old *East India House*, a great number of the specimens, of all classes, were by order of the Secretary of State for India at once transferred to the custody of the Trustees of the British Museum ; the bulk of the collections followed some years later. The present transfer comprised much historically important material, and numerous examples from the Sunda Islands, the fauna of which was very poorly represented in the British Museum.

Several medical men, serving on board H.M.S.S., followed the example of MacGillivray, who for so many years had contributed to our knowledge of the Pacific Fauna, particularly *F. M. Rayner*, surgeon on H.M.S. *Herald*, and *Dr. David Lyall*,

1856-1861. who, during the stay of H.M.S. *Plumper*, explored the sea and coasts of Vancouver Island. In the same field, extending his researches to all parts of British Columbia, worked *J. K. Lord*, who was attached as Assistant Naturalist to H.M. Boundary Commission on the N.W. coast of America, sending home several consignments of beautifully preserved specimens.

One of the most generous benefactors of the national collection, the late Mr. *B. H. Hodgson*, who some years before had sent vast collections of specimens and drawings made during his residence in Nepal, followed them up with a large consignment from Darjeeling. These collections were sufficiently important to induce Dr. Gray to prepare special catalogues of them in 1846 and 1863, which were supplemented by Dr. Günther's reports on the Reptiles and Fishes in the Proceedings of the Zoological Society.

Numerous specimens, chiefly Vertebrates and Insects, were selected and obtained by purchase from the collections sent home by travellers in foreign lands, like *H. W. Bates*, who was still on the Amazons; *A. R. Wallace*, who explored the Moluccas; *Mouhot*, who worked in Siam and Gamboja, unfortunately falling an early victim to the climate; and *P. B. Du Chaillu*, whose travels and experiences on the Gaboon excited general interest at that time.

With the progress of the Catalogue of Fishes contributions to this section of the collections came from all quarters, some of great importance. The Rev. *R. T. Lowe* and Mr. *J. Y. Johnson* recommenced their search in the sea off Madeira; Messrs. *O. Salvin* and *F. D. Godman* opened a field quite unexplored at this time, the freshwaters of Central America; Consul *J. Petherick* collected in the Mediterranean and on the lower and upper Nile; from *P. Bleeker* the first consignment (precursor of many others) of his types of fishes from the E. Indian Archipelago was obtained.

Of entomological collections the acquisition of large series of European, especially German, named Coleoptera, Hymenoptera (9000 *Ichneumonidæ*, collected by *J. F. Ruthe*) and Lepidoptera, assisted greatly in the arrangement of these orders; 5600 Insects of all orders from Madeira were purchased of *T. Vernon Wollaston*, and as many, formerly part of the *W. Kirby* Collection, of the Entomological Society of London. The Zoological Society presented their collection of 3500 specimens, including many types of species described by *N. A. Vigors* and others.

Other large collections were added to the section of Molluscs: one, consisting of 6400 shells, chiefly collected by *J. Gwyn Jeffreys* in the Mediterranean, was purchased; while *P. P. Carpenter's*

Mazatlan Collection (8800 shells), a second consignment of 1856-1861. *E. Chitty's* Jamaican Shells, and last, but not the least valuable, a series of 842 British Mollusca named by *Joshua Alder* himself, were presented.

Every other section received additions, but they were of considerably less extent and intrinsic value and cannot be enumerated here.*

GRANTS FOR ANNUAL EXPENDITURE.

(1856-61.)

The grants for expenditure were very uniform in these six years. They amounted to £1500 per annum for purchases, £700 for "preparing specimens," including spirit, glass-jars, camphor, etc., £1000 for printing catalogues and remuneration of the persons (not on the staff) preparing them, and £25 for the purchase of books of reference for the small departmental library.

* More detailed information is given in the Keeper's reports in the "Statement of Progress" annually laid before the House of Commons and printed by their order. One of the Keeper's duties is to supply the Board of Trustees with detailed monthly reports, in which not only the different branches of the Departmental collections, but also the share of the Assistants in the work, receive due attention. But the only vehicle by which the Keeper of a Department could convey to the outside world an idea of the progress of, and of the work on, the collections under his charge, was his Report in the annual Parliamentary Return. However, Dr. Gray does not seem to have desired to go beyond his monthly reports to the Trustees, or to awaken among wider circles, at home and in the Colonies, that sympathy with his efforts to increase the utility of the collections which is so useful in every public institution. His Parliamentary Reports therefore contained information in the most condensed form and of the most general character, and were usually contained in not much more than one or two folio pages. Dr. Günther gradually introduced more detail, specifying the several branches, and frequently referring to their needs as well as their progress. He also particularised the published contributions to science emanating from the collections in the Museum, beside the official catalogues. In this form the Parliamentary Reports, while they attained the immediate object for which they were prepared, serve now as a reliable guide in preparing a history of the development of the Department.

Another scarcely less important source of information is the Departmental correspondence. Dr. Gray did not take much care of his correspondence, and preserved but a small portion of it, more especially his early correspondence with foreign workers. His successor kept not only all letters received (except those referring to trivial matters), but also copies of his own. With the growth of the Department, this correspondence occupied much of the Keeper's time, as the principle (adopted for the whole of the establishment), that the conduct of Departmental affairs should be solely in the hands of the responsible head, was strictly adhered to. The correspondence of each year was arranged in alphabetical order and bound in a separate volume.

1862-69.

CONDITION OF THE COLLECTION.

1862-1869. — No noteworthy changes were made during this period in the exhibition in the public galleries; newly acquired specimens which appeared to be specially adapted for the purpose were constantly added, such as the group of Gorillas, *Baleniceps*, Viviparous Fish from Vancouver Island, etc. Dr. Gray directed the whole strength of the staff to the work of incorporating the acquisitions, which involved much revising of previously arranged material. He himself now devoted his time entirely to the revision and cataloguing of several sub-orders of Mammalia. Gerrard, who had catalogued some 700 skeletons and 3550 skulls, belonging to 1200 species, continued to maintain this fine collection in perfect order. Mr. G. R. Gray, who had to deal with comparatively few acquisitions, was engaged without intermission in determining the specimens of Birds, preparing the materials for his "Handlist of Genera and Species," and revising the whole of the Woodpeckers and Game-birds. Dr. Günther incorporated the numerous additions to the collection of Reptiles, assisted, in later years as far as Lizards were concerned, by A. W. E. O'Shaughnessy; the whole of the Snakes were named and systematically arranged; they amounted in 1866 to 5000 specimens of 827 species; the arrangement of the other orders of Reptiles and Batrachians was also maintained. But the principal work after his appointment on the permanent staff was to continue the arrangement of the Fishes; he completed it within this period, although the last volume of the catalogue was issued by the printer only in the following year (1870). The collection at this time was found to have risen from 16,000 (1858) to 29,300 specimens. —

The collection of Shells was increased in 1866 by the acquisition of the *Cuming* Collection of 83,000 specimens (see p. 19); its amalgamation with the series already in the Museum could not be undertaken immediately. This was a matter of many years' work; therefore, the collection was left as a whole for the present; unfortunately, before it was permanently placed in cabinets, the greater part of the specimens were transferred from the drawers lined with sheet wool in which Cuming had kept them, and gummed on tablets by Mrs. Gray, sometimes causing confusion and disfiguring many examples. Shortly after the purchase of this collection, Dr. Baird had the help of an addi-

tional Assistant, Mr. E. A. Smith, who assisted him in the 1862-1869. mounting and incorporation of miscellaneous smaller acquisitions.

Strenuous efforts were made by Dr. Gray to cope with the unarranged material in the entomological section. Mr. F. Smith, later assisted by Mr. C. O. Waterhouse, had to take up in succession the arrangement of several large Coleopterous families, only to find a few years afterwards that new incoming collections necessitated a renewed expansion of the arranged material. Mr. F. Walker completed the arrangement of the Moths, and was immediately employed on cataloguing the Heteropterous Hemiptera and the Orthoptera, of which he finished three and two parts, respectively, between 1867 and 1869. Mr. A. G. Butler, recently appointed, commenced work on the Diurnal Lepidoptera, cataloguing the specimens of the family Satyridæ.

THE STAFF OF THE DEPARTMENT.

(1862-69.)

The staff of Assistants was increased from four to seven or rather eight within this period ; Dr. Gray was thus enabled to dispense in a great measure with the outside help to which he had to resort in the preceding years.

In 1862 Dr. *A. Günther* was permanently appointed to a Senior Assistantship, to take charge of the collections of Reptiles and Fishes.

In 1863 Mr. *Adam White* retired ; in his place Mr. *A. G. Butler* was appointed, and employed upon the entomological collection temporarily ; he had to take up also Crustaceans, Myriopoda and Arachnida.

In 1865 Mr. *A. W. E. O'Shaughnessy* was transferred from other Departments to the Superintendent of the Natural History Departments, with instructions that he should assist Dr. Günther in his special work.

In 1866 Mr. *C. O. Waterhouse* was added as a Junior Assistant to the entomological section, and took up Coleoptera for his special study almost from the beginning.

In 1867 Mr. *E. A. Smith* was appointed in the same class of Assistants, to share with Dr. Baird the work on the enormous collections of Mollusca and "Lower Animals."

At this period Dr. Gray retained for temporary employment only the services of Mr. *F. Walker*. Mr. *Wollaston* and Dr.

1862-1869. *Johnston*, who prepared catalogues at home, or with the help of their private collections, did not take part in actual curatorial work.

LISTS AND CATALOGUES.

(1862-69.)

The majority of the publications issued by the Department in these eight years have already been referred to ; it will therefore suffice to recapitulate them shortly : Dr. Gray's Catalogue of the Hodgson Collection (1863) ; two parts of sub-orders of Mammalia (1866, 1869) ; Gerrard's Osteological Catalogue (1862) ; G. R. Gray's Lists of Birds, two parts (1867, 1868) ; his Catalogue of British Birds (1863) ; Dr. Günther's Catalogue of Fishes, 4 vols. (1862-8) ; Dr. Gray's List of Olividæ (1865) ; Vernon Wollaston's Catalogue of Coleoptera of the Canaries (1864) ; F. Walker's Catalogue of Moths, twelve parts (1862-6), of Heteropterous Hemiptera, three parts (1867-8), of Orthoptera, two parts (1868-9) ; A. G. Butler's Catalogue of Satyridæ (1868) ; of Fabrician types of Butterflies (1869) ; and Dr. Johnston's Catalogue of British Non-parasitical Worms (1865).

GROWTH OF THE COLLECTION.

(1862-69.)

In these eight years close upon 343,000 specimens were acquired, giving an annual average of 42,800 specimens. The donations exceeded the purchases in number ; by far the largest proportion belonged to the Class Insecta, the next numerous were Mollusca.

This extraordinary increase was due chiefly to the acquisition of two of the largest and most valuable private collections, each unique in its own way, that ever were added to the Department. As both consisted of a class of objects most popular with private collectors, it must be regarded as a most fortunate event that they were preserved entire for the National Museum.

The first of these collections was formed and presented by Mr. *J. C. Bowering*, who collected the Coleoptera of India and China during his residence abroad. He afterwards added to it selections from the collections made by *Wallace*, *Bates*, *Mouhot* and others, and from other famous collections, like *Chevrolat's* Longicornia, *Tatum's* Geodephaga, *Jekel's* Curculionidæ, etc.

The collection when received was in a perfect condition, and 1862-1869. numbered about 81,500 specimens.

The second was the *Cuming* Collection of Shells. Hugh Cuming devoted four years to the exploration of the Pacific coast of South America and of the South Pacific, and four other years to the exploration of the Philippine Islands, in search of shells. From the time of his return to England in 1840 to the end of his life in 1865 his whole interest centred in enlarging this collection, which was incomparably the richest possessed by any private person or museum. All malacologists had to refer to it, and every malacological work abounds in descriptions of species in the Cuming Collection. It was purchased by the Trustees for £6000, a special grant for its acquisition being made by Parliament. When it reached the Museum, it consisted of 82,992 specimens, representing 29,676 species or varieties.

Of the extremely numerous sources whence additions next in importance were derived, the following should be shortly referred to :—

The Linnean Society of London in 1863 transferred historically interesting specimens to the Museum, among them the Sir *Joseph Banks* Collection of Shells and Insects, containing types of species described by *Fabricius*; Mammals and Birds, chiefly from Australia, described in the Society's "Transactions"; *Mungo Park's* Sumatran and *J. W. Bennett's* Ceylonese Fishes; Insects described by *W. S. MacLeay* and *John Curtis* in the "Transactions."

The Lords of the Admiralty presented the collections made by Dr. *R. O. Cunningham* during the survey of Magellan Straits by H.M.S. *Nassau*, and comprising specimens of all classes (1868-69).

Dr. (afterwards Sir) *John Kirk* presented many specimens, chiefly Vertebrates, collected by him during the Livingstone Expedition in East Africa and at Zanzibar (1863 and following years).

The Indian Government presented a set of the collections made by the naturalists of the *Abyssinian* Expedition, chiefly Vertebrates, in 1869.

A selection of Vertebrates from the Dutch Museum of *T. G. Van Lidth de Jeude* was purchased: these specimens were left by the owner without labels indicating their origin, but were afterwards proved by Mr. Oldfield Thomas to be of great historical interest, some having been in *A. Seba's* possession, and figured in the "Thesaurus."

Further selections were made from the collections sent home

1862-1869. by Wallace, Mouhot and Du Chaillu, and a final consignment was received from J. K. Lord. The Rev. H. B. Tristram, who had been travelling in Palestine, deposited his collections (with the exception of Birds) in the Museum (1864), while Messrs. Salvin and Godman continued to add to their previous donations of Central American animals.

In 1865 and 1866 some noteworthy specimens of *Pachyderms* and *Cetaceans* were acquired, which were for many years prominent objects in the galleries of the new Museum: viz., in the former year the skin and skeleton of the Sumatran Elephant, the skeleton of *Rhinoceros sumatranus*, and the skeletons of an adolescent Whalebone Whale ("*Physalus latirostris*") and of an adult Sperm Whale obtained at Thurso. In the latter year the skeletons and skulls of the Fresh-water Dolphins of South America (*Inia* and *Pontoporia*) were purchased; and finally Sir Walter Elliot presented a series of skulls of Indian Dolphins, described by Professor Owen in the Transactions of the Zoological Society.

The ornithological collection was enriched not only by the donors of mixed collections already mentioned, but also by Sir A. Smith and Consul Swinhoe, who gave valuable series of S. African and Formosan Birds. Mr. C. Darwin presented his series of domestic breeds of Pigeons (1867), and in 1866 the skeleton of the Dodo exhibited in the gallery was obtained.

The most valuable additions to the Class of Reptiles were received as donations from correspondents of the Department, of whom only the following can be mentioned:—

G. Krefft, Curator of the Museum at Sydney, to whom the progress of our knowledge of this part of the Australian Fauna is chiefly due; Col. R. H. Beddome, the discoverer of the majority of species of *Uropeltidæ*; Mr. W. Theobald, who collected chiefly in Pegu; Prof. Barboza du Bocage, who was always ready to communicate examples of West African species from the rich collection in the Lisbon Museum; Dr. O. Wucherer, who during his many years' residence in Bahia thoroughly explored the Reptilian Fauna of that province.

The additions to the collection of Fishes were still more numerous and important. Beside the contributors mentioned in the preceding period, Col. R. L. Playfair sent large collections from Zanzibar, the Seychelles and Algiers in the years 1864-68, and Consul R. Swinhoe collected in various parts of China and in Formosa. A most valuable collection of Swedish fresh-water fishes was made by Mr. H. W. Wheelwright, the "Old Bushman" of

"*The Field*" newspaper; and a great number of correspondents 1862-1869. and friends in the British Islands brought the collection of British Fishes to a high state of perfection. Finally Capt. *Jesse Mitchell*, who was then Curator of the Madras Museum, sent a large consignment of the Fishes of the Presidency, partly in spirit, partly mounted, the latter being distinguished by a degree of taxidermic skill which can hardly be excelled; they were prepared by a native.

The *Entomological* section acquired by purchase in 1867 several large collections, the specimens of which fortunately had been authoritatively named by specialists: a selection of 2945 specimens of *Buprestidæ* and *Lamellicornia* from the *Robert Bakewell* Collection, the Rev. *Hamlet Clark's* *Phytophaga* (5600 specimens) and *Hydradeephaga* (8000 specimens), and *T. Vernon Wollaston's* Cape Verde *Coleoptera* (1535 specimens). In the following year *Desvignes'* collection of British *Ichneumonidæ* (6881 specimens) and *A. Murray's Nitidulidæ* (1062 specimens) were purchased, while Mr. *W. W. Saunders* presented 2118 *Neuroptera* and 5213 *Rhynchota* and *Diptera*, in addition to 3207 *Rhynchota* given in 1865. In order to assist the student of European *Lepidoptera* a series of 641 specimens named by *G. A. W. Herrich-Schaeffer* was purchased in 1862.

The collection of *Porifera* received in 1868 a valuable addition (the first for many years) through the purchase from Prof. *Oscar Schmidt* of a set of the Adriatic Sponges described by him: 407 specimens and microscopic preparations.

GRANTS FOR ANNUAL EXPENDITURE.

(1862-69.)

In these eight years the grant for purchases was reduced to £1000, with the exception of 1862, in which it was maintained at the old figure, viz., £1500. The grants for preparing specimens and for the publications remained stationary, viz., at £700 for the former and £1000 for the latter; only in 1863 these grants were reduced to £600 and £700 respectively. For the purchase of books £30 was now allowed.

The special grant of £6000 for the purchase of the Cuming Collection has been mentioned above; it was probably the cause of the temporary reduction of the ordinary grant.

1870-74.

CHANGES IN THE STAFF.

1870-1874. About the middle of 1869 Dr. *J. E. Gray* was prostrated by a stroke of apoplexy. Although he never recovered the use of his right arm and leg, his indomitable energy * enabled him to return to his official duties after a few months' illness and to continue to hold his post until the latter half of 1874. He then felt compelled by a complication of ailments to retire from the service of the Trustees, to which he had given fifty years of unremitting care and labour, and the severance from which he survived for some months only. He died in 1875, before he had vacated his official residence in the Museum.

To assist Dr. Gray in the administrative work the Trustees had resolved to create the post of an Assistant Keeper for the Department. Mr. *G. R. Gray* was appointed by the Trustees to this post, and after his death, in 1872, he was succeeded by Dr. *A. Günther*.

Dr. *W. Baird* died in 1871.

The two vacancies thus caused in the staff of Assistants were filled by the appointment of Messrs. *E. J. Miers* and *R. Bowdler Sharpe*. The former was directed to acquaint himself with the collection of Crustaceans and to act as amanuensis to Dr. Gray, while the latter was placed in charge of the Bird Collection.

ARRANGEMENT OF THE COLLECTION.

(1870-74.)

The work on the collections did not suffer any serious interruption by reason of these changes in the staff. In fact, the year 1870 found Dr. Gray in his place engaged in the continuation of catalogues and lists of certain sub-orders of Mammalia, Dr. Günther going over the greatly congested exhibited portion with the double object of ensuring the identification and elucidating the history of many of the specimens, and secondly of weeding out deteriorated or duplicate examples and substituting more perfect ones. This work included the Quadrumana, Carnivora and Edentata.

* A few days after his seizure, and while he still had difficulty in articulating, he sent for me and gave me his instructions as to completing the description of a new species, on which he had been engaged on the day of his illness.

Mr. G. R. Gray was principally engaged in the completion of 1870-1874. his "*Handlist of Birds*," which required his close attention to innumerable details. After his death it served as a most useful guide to Dr. Günther, in verifying the contents of the boxes in which the study-series was kept, and in relabelling them. But still more important work was entered upon; it was decided to prepare a general Catalogue of the collection of Birds on the plan of the Catalogue of Fishes. Mr. Sharpe threw himself with enthusiasm into this work, completing in the first year the Diurnal Birds of Prey, of which 2340 specimens referable to 341 species were in the collection. Of these, by far too large a proportion were exhibited in the gallery, viz., 723 specimens of 281 species.

In the class of *Reptiles* Dr. Gray went over the entire collection of Testudinata and Amphisbæniæ and catalogued them. The gigantic Land Tortoises, of which a large and still increasing collection had been got together, formed the subject of monographic treatment by Dr. Günther.

Mollusca.—In 1871 the Department lost Dr. W. Baird by death, and the collection of shells was now placed in the sole charge of Mr. E. A. Smith. His time was fully occupied by the incorporation of the large collections successively acquired in these five years: such as those presented by Mrs. Gray, Julius Brechley, G. F. Angas and others. The collection of Cephalopods had received many interesting additions since the publication of Dr. Gray's Catalogue in 1849; and Dr. Günther worked for some time at a MS. list, but he discontinued it in expectation of a promised monograph of this group by Professor Steenstrup (which, however, was never published).

Mr. Butler arranged the dry specimens of Myriopods and Arachnids; he also incorporated the Crustaceans and Insects from the Banks Collection, having taken charge of the collection of Crustaceans until Mr. Miers was able to relieve him of this duty.

Entomological Section.—Mr. F. Walker was now the only person still engaged in cataloguing parts of the collection, and he continued to work for the Department until 1873. The four entomological Assistants devoted themselves entirely to rearranging the specimens in the cabinets, and incorporating arrears. Much progress was made in this work between 1870 and 1874: Mr. F. Smith, after completing the arrangement of Hymenoptera (to the *Thynnidæ*), joined Mr. C. O. Waterhouse in his work on the Coleoptera; they arranged the sub-family *Clytinæ*, which in

1870-1874. 1873 proved to number 1525 specimens referred to 362 species, inclusive of 134 types; they then proceeded to the family *Buprestidæ*, of which, after the accession of the Saunders Collection, the Museum certainly possessed the finest and most complete series of the time; it occupied 70 drawers, and consisted of 11,036 specimens referred to 3263 species, including 449 types; this work was completed in 1874. The collection of Moths, on which Walker had been engaged from 1854 to 1866, was overloaded with additions, so that on this account alone a rearrangement and expansion had become imperative. Mr. Butler undertook to work at it from 1874, after he had been similarly engaged on the Homoptera. This order occupied 151 drawers, consisting of 10,161 specimens which were reputed to belong to 4046 species. Mr. Walker finished the cataloguing of the Dermaptera Saltatoria in 1870, and of the Heteropterous Hemiptera in 1873. Finally, Mr. F. Smith arranged the whole of the Diptera in the years 1874 and 1875: this order occupied 90 drawers, and was represented by 7162 species and 15,102 specimens.

No progress was made in the arrangement of any of the *Radiata*; but particularly interesting examples were added to the exhibition-series.

LISTS AND CATALOGUES.

(1870-74.)

Catalogue of Monkeys, Lemurs and Fruit-eating Bats. By Dr. Gray. 1870.

Catalogue of Seals and Whales. Supplement. By Dr. Gray. 1871.

Handlist of Seals, Morses, Sea Lions and Sea-Bears. By Dr. Gray. 1874.

Catalogue of Ruminant Mammalia. By Dr. Gray. 1872.

Handlist of the Edentate, Thick-skinned and Ruminant Mammals. By Dr. Gray. 1873.

Handlist of the Genera and Species of Birds. Parts II. and III. By G. R. Gray. 1870-71.

Catalogue of Birds. Vol. 1. By R. Bowdler Sharpe. 1874.

Catalogue of Shield Reptiles. Part 1. Supplement. By Dr. Gray. 1870. Appendix, 1872. Part 2, 1872.

Handlist of the Specimens of Shield Reptiles. By Dr. Gray. 1873.

Catalogue of Dermaptera Saltatoria. Parts 3-5. By 1870-1874.
F. Walker. 1870.

Catalogue of Heteropterous Hemiptera. Parts 4-8. By
F. Walker. 1871-4.

Catalogue of Sea-pens. By Dr. Gray. 1870.

Catalogue of Lithophytes. By Dr. Gray. 1870.

The majority of these catalogues were of small extent, and some even fragmentary. But the value of the zoological publications of the British Museum was generally acknowledged, on account of their usefulness not only to the Museum, but to all workers in systematic zoology at home and abroad; and experience had shown that descriptive catalogues of a monographic character, with a complete enumeration of the specimens in the Museum, indicating their individual history, were the most useful and the most desired. Dr. Gray fully agreed with Dr. Günther that it was the duty of the Museum to furnish illustrations, whenever possible, of the new species described from specimens in the Museum collection. There was now little fear that the increase of the cost of production would prove to be a serious obstacle, in view of the undeniable direct and indirect benefits accruing from these publications to the collections. They were the strongest evidence of the life and activity of a Department which made every effort, not only to raise the collections to the level of the status attained by science, but also to contribute towards its advancement.

Of course, no catalogue should be undertaken unless the collection to be catalogued has attained to a certain degree of completeness, and this was evidently the case with several collections, especially those of Chiroptera and of the Birds, for which, fortunately, the services of very competent specialists were available.

Mr. *G. E. Dobson*, a surgeon in the Royal Navy, who had already given much attention to the study of *Chiroptera*, and had catalogued the specimens in the Calcutta Museum, was in England about this time and ready to undertake the cataloguing of the collection in the British Museum, which numbered about 2500 specimens. The plan of the catalogue was to be the same as that of Fishes, but with illustrations. Mr. Dobson commenced this work about 1873; owing to interruptions caused by attendance to his duties at Netley Hospital, and by visits which he paid to several continental Museums, he did not complete it before 1878. This catalogue, long out of print, still stands as

1870-1874. a standard work on the order, and as a lasting monument of the author. He followed it up with his monograph of Insectivores, intending to prepare afterwards a catalogue of this order for the British Museum; but the trying and exhausting labours connected with this research broke down his health, which had been already enfeebled by repeated malarial attacks. He died in 1895.

It was estimated that the preparation of a Catalogue of *Birds* on the same lines as the preceding would take not less than from ten to twelve years, and result in the publication of at least as many volumes. But Dr. Günther, in recommending Mr. Sharpe for this work, relied upon the well-known energy and enthusiasm of this young ornithologist, who had already given evidence of his great abilities and power of application. Neither he nor Mr. Sharpe anticipated that the work would take about double that time, grow to twenty-seven volumes, and require the co-operation of ten additional specialists. On the other hand, the catalogue fulfilled everything expected from it. Apart from the fact that it is the standard work for all engaged in systematic ornithological work, the unparalleled growth and development of the Bird collection are in great part, if not wholly, owing to it. Probably all the private collectors who during the years of its progress were induced to place their own cherished collections in the British Museum, did so because they saw that they would be kept under conditions under which they were most likely to be of use for the advancement of science. A comparison of the material on which the first three volumes of the catalogue were based, with that embodied in the last three, will amply prove the immense importance of these catalogues.*

GROWTH OF THE COLLECTION.

(1870-74.)

In these five years close upon 67,500 specimens were acquired, giving an annual average of 13,500 specimens. But for the two largest acquisitions, which consisted of Shells and Coleoptera, the accessions were more equally distributed among the various branches than usual; and the diminution in number was fully

* The earlier volumes have been out of print for some time; and if a new edition of the catalogue should be prepared, it might be advantageous to detach the lists of specimens from the descriptive part, and to issue them in a separate volume.

compensated by the extraordinary proportion of valuable and 1870-1874. interesting specimens.

Of Mammalia, the collection was enriched by the purchase of most welcome series from Madagascar and Abyssinia: the former included specimens of the Ruffed Lemur, showing the extraordinary individual variation of this species; they are still exhibited in the Gallery. The latter consisted of a number of large animals, among them the skeleton of a Giraffe. A series of very interesting forms from Colombia was purchased of the collector, Mr. J. K. Salmon. Some of the most interesting types of the Cetacean Collection were acquired in this period, among them the specimen of the Piked Whale that stranded at Weymouth (1871), skeletons of *Kogia breviceps* from New South Wales, of the Fresh-water Dolphin of the Ganges and Indus, of *Grampus griseus* (two skeletons and one stuffed), also a skeleton of the Antarctic Right Whale (*Balæna australis*), and others.

The collection of Birds was enriched by the purchase for £1000 of Mr. A. R. Wallace's series of Malayan birds. He had retained for himself the best specimens which he was able to obtain during his travels, 2474 in number, representing about 1000 species, many of them being unique or types. Of other remarkable additions should be mentioned the Gould Collection of Falcons, a portion of the Sharpe Collection of African birds, and the Swinhoe series of Hainan birds: all purchased.

The most important acquisition for the Reptilian branch was the purchase of the collection made by Colonel R. H. Beddome in Southern India. In his position as Conservator of Forests in the Madras Presidency he had unusual opportunities for collecting in districts rarely or never before visited by naturalists. The Museum had previously received from him several smaller consignments, but this collection consisted of 1518 specimens, well illustrating the Reptilian Fauna of the Hill-district of Southern India. A second Indian collection of Reptiles and Batrachians, containing a number of species named by the donor, was presented by the late Mr. T. C. Jerdon after his return to England. Of other donations, one from the Academy of Sciences of St. Petersburg, containing many named species of Reptiles and Batrachians (and Fishes) from the southern and eastern parts of the Russian Empire, deserves particular notice. A large collection of Reptiles and Batrachians from North Borneo was purchased and described in a separate report.

To the collection of Fishes some 4000 specimens were added by donation, exchange, or purchase; they were received from

1870-1874. many sources, and the majority were immediately reported on, on account of the novelties among them: thus, Dr. *J. Rein's* Fishes from Morocco; Dr. *W. H. Colvill's* from the River Tigris; Dr. *C. von Fritsch's* from Siberia; Mr. *R. Swinhoe's* from China; Mr. *T. C. Jerdon's* from India; Dr. *A. B. Meyer's* from Celebes; Dr. *C. B. Klunzinger's* from the Red Sea; a large series from Australia, including beautiful specimens of *Ceratodus*, through Mr. *G. Kreff*; Mr. *Morton Allport's* second consignment from Hobart; large collections of South Sea Fishes from the *Godeffroy* Museum, and a very interesting series of New Zealand Fishes from the *New Zealand Institute*.

The large collection of Shells previously alluded to was presented by Mrs. *J. E. Gray*, who had formed it during the many years of a happy married life, in which she took an active part in the conchological studies of her husband. The collection consisted of some 12,000 specimens, and was formed with the sole object of serving as an aid in systematic work; there were, however, a considerable number of types included in it. Of importance was also a donation of 446 shells (inclusive of 124 types) by the widow of the Rev. *T. Lombe Taylor*.

In 1873 the late Mr. *J. Treherne Moggridge* presented specimens of the species of Trap-door Spiders which he had observed in the Riviera, and so admirably described in his "Harvesting Ants and Trap-door Spiders"; with a series of the burrows. These specimens were reserved for the exhibition gallery.

Of the additions to the Entomological section the purchase of Mr. *Edward Saunders'* collection of *Buprestidæ* in 1874 was the most important; it consisted of 7267 specimens referable to 2974 species, including 364 types. Other noteworthy acquisitions by purchase were 542 Coleoptera from Texas, *A. R. Wallace's* Sarawak Lepidoptera (555 specimens), 2400 named European Microlepidoptera, and a selected series of Orthoptera described by *Brunner von Wattenwyl*.

For the exhibition-series of Corals and Sponges, magnificent specimens were mounted: of *Antipathes* from the Bermudas and Samoa Islands, of the gigantic *Osteocella septentrionalis* from British Columbia, of *Pheronema* from the coast of Portugal, of *Meyerina* and *Crateromorpha* from Cebu.

Beside these acquisitions, which included specimens of two classes of animals only, the Department received mixed collections from travellers, some containing several thousand examples,

which had to be sorted and were mostly examined by 1870-1874. the staff: the Rev. *A. E. Eaton* presented a collection of Crustaceans, Annelids, Echinoderms, Tunicates, Coelenterates, and Sponges, which he made during a visit to Spitsbergen; a similar collection made on a dredging excursion of the yacht *Norna* to the coast of Portugal was purchased; Mr. *F. D. Godman*, who had explored the Azores, sent as a first instalment a collection of some 1500 insects, chiefly Lepidoptera and Coleoptera; the late Mr. *Julius L. Brenchley* presented a liberal selection from the collection* which he made during the cruise of H.M.S. *Curaçoa* among the South Sea Islands, and which comprised animals of all classes; the more interesting part of this collection was described by members of the staff of the Department in Mr. Brenchley's book, "The Cruise of H.M.S. *Curaçoa*," 1873; selections of animals belonging to all classes were acquired from the collections made by Dr. *A. B. Meyer* in Celebes and the Philippines; a large collection of marine animals dredged by Captain *H. C. St. John* on the coasts of Japan was transferred by Mr. *J. Gwyn Jeffreys* to the Museum, where the Mollusca, 640 in number, were examined and reported upon by Mr. *E. A. Smith*; finally, a set of 31 species of Mammals, 319 specimens of Birds, and 148 Reptiles, illustrating the Persian Fauna as described by Mr. *W. T. Blanford*, was obtained from him by exchange.

GRANTS FOR ANNUAL EXPENDITURE.

(1870-74.)

In these five years the grants for the various services remained stationary; they were £1000 for purchases; £700 for preparing; £500 for cataloguing; and £30 for the Departmental Library.

THE NEW MUSEUM.

(1870-74.)

In 1871 plans for the new Museum were submitted to Dr. Gray for examination and suggestions as far as the Zoological Department was concerned. He generally approved of them, but expressed it as his opinion that if only one-half of the building were allotted to Zoology he would have no more room for the display and storage of the collections than at Bloomsbury. He enclosed a letter from Dr. Günther, who pointed out that no

* The remainder of his collection went to the museum of his native town, Maidstone.

1870-1874. provision had been made for the safe reception of the collections preserved in spirit and proposed that a separate building should be erected. Dr. Gray also objected to the erection of exhibition cases hermetically closed in front, and with the doors at the back, as proposed by some witnesses before the Royal Commission in 1872.

In 1873 the building had made such progress that the Trustees ordered the Keepers to watch its progress for the purpose of seeing that the arrangements of the several galleries were carried out in the manner that had been settled and approved by the Trustees.

1875-78.

ARRANGEMENT OF THE COLLECTION.

When Dr. Günther became Keeper of Zoology as Dr. Gray's successor he had to direct the work of the Department with the prospect of moving the collections before many years had elapsed, and with the view of satisfactorily arranging them in their new home. All required more or less preparation for the impending change, but, perhaps, none more so than the exhibition-series of *Mammalia*, which for some years to come received the Keeper's unremitting attention. The process of withdrawing from the exhibition deteriorated specimens and types and substituting others was systematically continued. The purchase of extensive and unnamed collections was avoided as much as possible, preference being given to specimens of special value, or of particular interest to the student, sportsman, or the general public. Many of the specimens, skeletons as well as skins, which are still ornaments in the galleries, were added or mounted during these years. Mr. Dobson's arrangement of the Chiroptera falls chiefly within this period, the catalogue being published in 1878.

The changes in the arrangement of the *Birds* in the gallery proceeded with the progress of the catalogue, Mr. Sharpe withdrawing the typical and many duplicate examples. Dr. Günther commenced about this time to form the collection of groups of British nesting-birds with their natural surroundings, the perishable parts, like leaves, flowers, etc., being artificially reproduced. The object of this mode of exhibition was to give to the host of visitors who have hardly any opportunity of seeing or watching the wild birds of their own country a glimpse into their domestic arrangements. In order to render the groups absolutely true to life, it was an essential condition that both parents, with

their eggs or the young belonging to the nest, should be taken, 1875-1878. and that the actual surroundings which determined the selection of the site by the birds should be preserved. The interest shown by the public in these groups, and the amount of instruction conveyed by them, proved fully to justify this mode of exhibition; it has been followed in other large Museums. By the help of friends resident in the country additions have been made year by year to this collection, until now it is nearing completeness.*

Reptiles.—Mr. O'Shaughnessy completed his general arrangement of the accessions to the Lizards. The accessions to the Snakes were incorporated, and periodical reports on the new species published.

Fishes.—Beside the usual routine work, a systematic MS. list of all the species described since the publication of the Catalogue was compiled by Mr. O'Shaughnessy; an important work, by which not only the acquisition of desiderata can be regulated, but by which also the determination of the new additions is greatly facilitated. A very large and well-preserved example of the Basking Shark was temporarily deposited in the Mammalian Saloon, its large size proving an insurmountable obstacle to its being placed in the British Gallery.†

The incorporation of the accessions to the *Shell* collection made steady progress; Mr. P. S. Abraham took up the study of *Nudibranchs*, the study-series being arranged by him, while a series of 53 glass-models of representative forms was acquired for exhibition.

Mr. Miers devoted himself chiefly to the arrangement of Brachyurous *Crustaceans*, besides attending to reports on various groups or accessions.

* The notice of this series must not be passed without acknowledging the Keeper's indebtedness to Lord Walsingham, who gave him every encouragement by entering fully into the spirit of this new departure in exhibiting specimens in the Museum and supplying him with the materials for a great number of groups of birds resident at Merton. The Keeper also was most fortunate in obtaining the help of Mr. H. Mintorn, Mrs. E. Moggridge and Miss E. D. Emmett (now Mrs. V. H. Blackman) for modelling the perishable portions of the surroundings of the nests. An account of the history and extent of the series is given in *Good Words*; and Mr. Ogilvie-Grant's "Guide to the Gallery of Birds," published by the Trustees in 1905 (Second Edition, 1909), contains a list of the collection at the present time; the descriptions are reproductions of the explanatory labels.

† In the new Museum it was the most conspicuous object in the Fish Gallery. It was a fully adult British specimen, of the male sex, 28 feet long, and it was in a perfect state of preparation. It had been referred to in various Ichthyological works. In later years it was replaced by a female specimen from Norway.

1875-1878.

In the *Entomological* section the routine-work was continued, such as incorporating acquisitions, reporting on such as required immediate attention, etc. In 1878 alone the entomologists added 822 types of Coleoptera, Hymenoptera and Lepidoptera to the collection. Mr. Waterhouse continued the systematic arrangement of the general series of Longicorns, and afterwards proceeded to similar work on the *Lycidæ*.

Finally, the large collections made by the naturalists of the "Transit of Venus" Expeditions (see p. 35) were examined, and partly incorporated, partly distributed among other institutions. This service, in which nearly the whole staff participated, was completed with the publication of the "Report" in the 'Philosophical Transactions,' under the joint editorship of Sir J. Hooker, President of the Royal Society, and the Keeper of the Department.

The arrangement of the *Coral* collection, which as a whole had never received full attention, and to which many specimens had been recently added, had become very urgent, the more so as a separate gallery in the new Museum had been assigned to them and the Sponges. The offer for this service of Dr. F. Brügge-mann, a young naturalist who had worked out the Jena collection to Professor Haeckel's entire satisfaction, was accepted by the Trustees. He was engaged to prepare a descriptive catalogue, a task for which he possessed all qualifications. Industrious, painstaking, methodical, he had made very good progress, when the work was unexpectedly interrupted by his death in April, 1878. The MS. which he left showed that he had actually determined 1900 specimens, and his successors in later years profited not a little from it.

The study of the collection of *Sponges* had been intermittently taken up by Dr. Gray, but he had to limit himself to the description of particularly striking forms, and he did not enter into a systematic study of their minute structure. He received, however, great assistance from the late Mr. H. J. Carter, F.R.S., who devoted several years to the generic determination of the collection, publishing the most important results of his studies in a series of well-known memoirs. He completed the work about this time, depositing in the Department a MS. catalogue which proved to be of great service to the Assistants who continued his work in the following years. Mr. Carter also gave his assistance in the arrangement of the general portion of the Bowerbank collection acquired in 1876, and later, in a similar examination of the British portion.

CATALOGUES.

(1875-78.)

Catalogue of the Chiroptera. By G. E. Dobson. Pp. xxxvi., 1875-1878. 567, with 30 plates. 1878. 8vo. Referred to above, p. 25. —

Catalogue of Birds. Vols. 2 and 3. By R. Bowdler Sharpe. Vol. 2, pp. 325, with 14 plates. 1875. Vol. 3, pp. 343, with 14 plates. 1877.

While Mr. Sharpe was occupied with the preparation of the fourth volume of his Catalogue, it became evident that, unless additional help was obtained, the progress of the work would be unduly protracted, to the injury of the collection and of Ornithology. Mr. Sharpe experienced so numerous and serious interruptions by having to attend to other, chiefly routine duties, as well as to the claims of the increasing number of visitors, that he was unable to pay attention even to the exhibition-series. Therefore Dr. Günther decided to obtain, whenever possible, the assistance of such Ornithologists as had paid special attention to the study of the groups to be catalogued; and the Trustees entrusted the preparation of the fifth volume to Mr. *Henry Seebohm*, who was then engaged in work on the families of Warblers and Thrushes.

Gigantic Land-Tortoises (living and extinct). By Dr. Günther. Pp. 96, with 55 plates. 1877. 4to.

Based entirely upon the (then) unrivalled material in the Museum, which afterwards formed a conspicuous feature of the Reptile Gallery in the new Museum.

Catalogue of Marine Polyzoa. By George Busk. Part 3. Pp. 39, with 38 plates. 1875. 8vo.

This was the concluding part of Mr. Busk's work on Polyzoa, commenced twenty years previously. Another twenty years elapsed before the collection, on which this catalogue was based, was acquired by the British Museum.

Catalogue of British Hymenoptera. Part 1. *Andrenidæ* and *Apidæ*. By F. Smith. Pp. 236, with 11 plates. 1876. 8vo.

A second edition of the catalogue of which the first edition appeared in 1855.

Illustrations of Typical specimens of Lepidoptera Heterocera in the Collection of the British Museum. Parts 1 and 2. By A. G. Butler. Pp. 62 and 62, with 20 plates in each part. 1877, 1878.

These parts were the commencement of a new series. It

1875-1878. appeared at this time hopeless to undertake a general descriptive catalogue of any particular order or group of Insects. This kind of work absorbs the whole time and energy of the author, and the entomological staff was numerically barely sufficient to cope even with the initial work entailed by the constant flow of incoming accessions. But as the entomological collections were exceedingly rich in types (many of them but imperfectly known), it seemed to be an important service to workers in Entomology to render such specimens accessible to them by description and figure. With this object in view this series of Museum publications was initiated, and continued until the time arrived when a complete catalogue of all the species known could be undertaken.

STAFF.

(1875-78.)

On Dr. *Günther's* appointment to the Keepership, Mr. *F. Smith* succeeded him in the post of Assistant Keeper. By his long experience and intimate acquaintance with the Entomological collections, Mr. Smith was specially qualified to advise the Keeper in all matters referring to this section. He continued, besides, to share in the actual curatorial work in whatever branch of these collections assistance was required.

Dr. *Günther* repeatedly urged an increase in the staff of Assistants, and recommended to the Trustees the appointment of two Senior Assistants with some experience in systematic work. The Treasury finally consented in 1878 to the addition of two Junior Assistants, so that by the end of this period the staff consisted of the following members:—

1. Mr. A. G. Butler, who had charge of the Lepidoptera, Myriopoda and Arachnida.

2. Mr. C. O. Waterhouse, whose principal duty was to attend to Coleoptera.

3. Mr. E. A. Smith, who had charge of the collection of Mollusca, and, for several years, of what was formerly comprised under the collective name of Radiata.

4. Mr. E. J. Miers, who worked now exclusively on Crustacea.

5. Mr. R. Bowdler Sharpe, who had charge of the Birds.

6. Mr. M. R. Oldfield Thomas, who was transferred in August, 1878, from the Secretary's office, to fill the vacancy caused by Mr. F. Smith's promotion, and who was at first temporarily employed in assisting the Keeper in clerical work, and subsequently

directed to acquaint himself with Mammalia, especially the 1875-1878. order Rodentia.

7. Mr. *S. O. Ridley*, and

8. Mr. *F. J. Bell*, who were appointed in 1878, and subsequently took charge, the former of Polyzoa, Hydrozoa and Anthozoa, the latter of Worms and Echinoderms.

9. Mr. O'Shaughnessy's position in the Department has been defined above (p. 17); he now had charge of the collections of Reptiles and Fishes.

Dr. *F. Bruggemann* worked on the Corals to the time of his death (in 1878), and Mr. *H. Seebohm* commenced the preparation of the Catalogue of Turridæ.

GROWTH OF THE COLLECTION.

(1875-78.)

There was in these four years no great fluctuation in the annual increase of the collection; the total increase was 95,200 specimens, giving an annual average of 23,800.

Of the acquisitions, which contained animals of nearly all classes:—

1. The most important and extensive were the collections made by the naturalists attached to the "Transit of Venus" Expeditions to Rodriguez (Messrs. *H. H. Slater* and *G. Gulliver*) and Kerguelen (Rev. *A. E. Eaton*). These collections being at the disposal of the Royal Society were offered by the President and Council to the Trustees under the condition that a complete set should be retained for the British Museum, and that the duplicates should be distributed among five named institutions.

2. The zoological specimens obtained by Captain *H. W. Feilden*, the naturalist of the Arctic Expedition of 1875, were partly presented by the Lords Commissioners of the Treasury, partly by the collector. Although not very numerous, they were of great interest, including specimens of the Musk Ox, nestlings of the Knot, new species of Fishes and Shells, etc.

3. Commodore *James G. Goodenough*, whilst in command of the Australian Station, and cruising in H.M.S. *Pearl* among the islands of the South Pacific, gave every encouragement to his private secretary, Mr. W. Wykeham Perry, and to Surgeon A. Corrie, to collect at the localities visited. Many consignments reached the Museum from this source; and by the death of Commodore Goodenough, caused by a wound from

1875-1878. a poisoned arrow, the Museum lost one of its most zealous contributors.

4. The Museum was indebted to officers of the Royal Navy for yet another important service. Rear-Admiral the Hon. A. A. *Cochrane*, commanding on the Pacific Station, directed Commander W. E. *Cookson*, of H.M.S. *Petrel*, to obtain, during his visit to the Galapagos Islands, specimens of their Fauna, especially the large Tortoises. In this Commander Cookson was very successful, and the specimens were presented to the Trustees by direction of Admiral Cochrane.

5. A set of the specimens brought home by the expedition of the *Bremen Geographical Society* to Western Siberia and Turkestan was acquired by purchase.

6. Mr. H. *Batson Joyner* made valuable collections of Fishes, Crustaceans and other marine animals during his residence at Yokohama, and presented them to the Trustees.

7. The second-best set of the conchological and entomological collections, made by the late Dr. F. *Welwitsch* in Angola, was delivered to the Trustees by the executors of the collector, as from the King of Portugal, in accordance with the decree of the High Court of Judicature, Nov. 17, 1875.

8. Captain H. C. *St. John*, R.N., had continued his dredging operations in the Japanese and Korean Seas since 1873, when his first consignment of Shells was received. He presented in 1878, again through Mr. J. Gwyn *Jeffreys*, a much larger collection, comprising marine animals of various classes.

Beside specimens included in these mixed collections, further consignments of *Mammalia* from Madagascar and Abyssinia were purchased, including such valuable objects as skins and skeletons of *Rhinoceros keitloa*, *Kobus sing-sing*, *Lycaon*, *Orycteropus*, etc.; 44 Mammals from N.W. Borneo were obtained from Mr. (later Sir) *Hugh Low*; 54 from Cochin China were presented by *L. Pierre*. Mr. C. G. *Danford's* *Mammalia* from Asia Minor, Mr. *Everett's* from the Philippine Islands, and Mr. G. *Brown's* from Duke of York Island, were purchased.

For the Cetacean collection a unique series of Antarctic forms (skulls or skeletons of *Megaptera novæ-Zelandiæ*, male and female *Globocephalus "macrorhynchus"*, *Delphinus "fosteri"*, *Mesoplodon hectoris*, *Neobalæna marginata*) were obtained by exchange. A skeleton of *Ziphius cavirostris* from the Cape was purchased.

Birds.—The remainder of Mr. *Sharpe's* collection of African Birds was purchased in several instalments, as were Dr. J. B. *Steere's* Philippine Island Birds, which included 20 new species.

A most valuable collection of 1303 specimens from India, Burmah 1875-1878. and Malacca was presented by Captain *Stackhouse Pinwill*. — Messrs. *Godman* and *Salvin* presented their collection of 6650 eggs, all of which are well authenticated and in a perfect state of preservation.

The collections of *Reptiles* and *Fishes* received comparatively few additions; two consignments from the Rio de la Plata, which were purchased, were perhaps the most noteworthy.

Mollusca.—The additions made were chiefly donations, the most important of which was the collection of Shells bequeathed by the late Rev. *R. T. Lowe*. It consisted of about 15,000 examples, and was a very complete representation of the Shell-fauna of Madeira, the Cape Verde Islands and the neighbouring parts of Africa. Mr. *G. F. Angas* made further valuable donations, aggregating 452 specimens, of named Shells from South Australia, and Captain *H. W. Feilden* presented his collection of 1044 Shells from Malta. A selected series of 1057 named Shells, containing many types and other historical specimens, was purchased from the late Mr. *Henry Adams*' collection.

The first consignment of the material on which the *Challenger* Reports are based, was delivered in 1878; it consisted of 337 Brachiopods, reported upon by the late Mr. *T. Davidson*, F.R.S.

The *Crustacean* collection received special attention, and was enriched from numerous sources; in 1876 alone nearly 1200 specimens were added, chiefly by donation, and are included in the mixed collections enumerated above. Of the purchases the most interesting was a collection of 75 species from Lake Baikal.

In the *Entomological* section the most noteworthy accessions were in the *Coleoptera*: Mr. *Godman* presented a second series of *Coleoptera* from the Azores. The St. Helena collection collected by the late *T. V. Wollaston* and described by him in his work "*Coleoptera Sanctæ-Helenæ*," 1550 specimens; a selection from *Edwin Brown's* collection (3300 specimens); a portion of *Andrew Murray's* collection; 1100 *Lepidoptera* collected by *F. M. Jonas* in Japan and Formosa; and 500 *Coleoptera* from Abyssinia, were purchased. Finally, Captain *Stackhouse Pinwill* presented his collection of 1488 *Lepidoptera* from Malacca, containing some 70 species new to the Museum collection.

The Bowerbank Collection of Sponges.—This was estimated to contain at least 7000 specimens and preparations, of which the most important part was the series of British species described by

1875-1878. Dr. J. S. Bowerbank in his "Monograph of British Spongiadæ," which was published by the Ray Society in four volumes. The foreign series comprised a great number of types also described by its former owner as well as a number which are still undescribed. This purchase comprised also the microscopical preparations showing the structure of the forms described, and two MS. catalogues. The Trustees acquired the whole for the moderate sum of £300.

GRANTS FOR ANNUAL EXPENDITURE.

(1875-78.)

In these four years the grants for purchases of specimens and books were the same throughout, viz., £1200 for the former and £25 for the latter. The grant for "Preparing, etc.," which was £555 in 1875, was raised to £705 in the three following years; finally, the grant for preparing and publishing Catalogues was £500 in the first two years, and £1000 in the two others.

THE NEW MUSEUM.

(1875-78.)

In the financial year 1875-76 the building at South Kensington was sufficiently advanced to allow of its definite allocation to the four Natural History Departments. To that of Zoology was assigned the western wing of the building, and an apartment on the ground-floor of the central portion, behind the so-called Index-Museum. This amounted to nearly one-half of the whole building, but was not too large for the requirements of the Department, as, in fact, Dr. Gray had pointed out to the Trustees as far back as 1871. It was evident that to provide more accommodation for exhibition and storage, some structural changes were necessary:—

1. There was no room for the collection of Cetaceans, even if two of the galleries, one for stuffed specimens and another for skeletons, were given up for Mammalia. A large portion of the cemented basement (138 feet \times 60 feet) was therefore partitioned off by a wall. Although inconveniently intersected by massive pillars, and not well lit, it afforded room for five of the largest skeletons of Whales, and for a great number of others of smaller size; it had the advantage of having another smaller compartment annexed to it, in which the unmounted specimens

could be stored, thus answering its temporary purpose well enough until still better accommodation could be given for a collection of great value, which, besides, was such as had never been exhibited before. 1875-1878. —

2. The northern galleries on the ground-floor, six in number, had been built of unequal width, three alternate ones being nearly double the width of the others. This plan had been adopted by the architect with the idea that the narrow galleries would be utilised as commodious rooms for students, and would be separated from the broad exhibition-galleries by the row of cases only. This arrangement was unfortunately not consistent with the conditions in the new building; and all these galleries had to be separated from each other by partition-walls, each gallery being devoted to a separate division of animals.

3. No provision whatever had been made for housing the specimens preserved in spirit, which in the old building already occupied every available space in three large rooms. However, even if room could have been found, the danger of introducing some 5000 gallons of highly inflammable spirit into the main building was so real that the Keeper recommended the Trustees to erect for the reception of this collection a separate fire-proof building at the back of the Museum. The Trustees adopted this recommendation (October, 1875), which, after some hesitation (December, 1876; May, 1878), was sanctioned by the Treasury (March, 1879). The Keeper submitted plans of the building and fittings. Taking for a basis of calculation the area occupied by this collection at Bloomsbury and the capacity of the cases, the building was intended to supply five times that space, beside three rooms for the staff and students, and an annex for redistilling old spirit; it was calculated to give sufficient room for the increase of the collection in the next fifteen or twenty years.

Surprise has sometimes been expressed that the large gallery on the ground floor was not selected for the exhibition of the Mammalia, which include the bulkiest and heaviest objects. This, indeed, was the original intention; but when the Keeper prepared the plans for the fittings of the various galleries, he found that the bas-reliefs with which the Architect had ornamented the capitals of the columns against which the cases abut would not allow the erection of cases of a size required for this particular exhibition; in consequence the Mammals had to be consigned to the gallery on the first floor, in which the terra cotta ornamentations had not yet been fixed. However,

1875-1878. a considerable advantage was gained by this change in location, inasmuch as the stuffed Mammalia were thus brought close to the exhibition of skeletons in the gallery above, and the exhibition-series of Birds into immediate contiguity with the study-series.

A scheme for the furniture and fittings was prepared by the Keeper, and although all the movable furniture, including the valuable stock of table-cases, used at Bloomsbury were available for the new museum, the estimated cost of the new furniture required amounted to £55,698. The details of construction had now to be worked out, and as the fittings and cases had to be adapted for very different collections and objects, and to particular architectural features, they varied greatly in the different rooms and galleries. The plans for each kind of case were prepared from the Keeper's requirements by the architect or the experts of the Office of Works and submitted to the Trustees for their sanction. Although anxious to supply substantially-constructed cases and cabinets, the Office of Works were also desirous of keeping the enormous expenditure at the lowest possible figure. By substituting mahogany for the metal recommended by Dr. Günther in the construction of the door-frames of the gallery-cases they claimed to have effected a saving of £15,000.

In connection with these preparations for the impending move it should be mentioned that from 1876 Dr. Günther urged upon the Trustees the necessity of beginning the formation of a Zoological Library, such as would compensate the Department for the loss of the use of the General Library at Bloomsbury. With the assistance of some of his colleagues in the Printed Book Department he estimated the cost of its formation (up to date) at £40,000, and asked the Trustees to apply to the Treasury for a grant of £8000 as a first instalment. This estimate seemed to act as a deterrent, for no provision was made for this service in the following year, but the Trustees adopted Dr. Günther's recommendation that duplicate zoological works in the General Library should be transferred to the Departmental Library.

1879-81.

CHANGES IN THE STAFF.

The year 1879 was one of more than usual activity and 1879-1881. progress; unfortunately it was also one in which the Department lost one of its oldest and most valued officers, *Frederick Smith*, who died on February 16th. He had been in the service of the Trustees for twenty-eight years, and was promoted to the rank of Assistant Keeper in 1875. He set an example to the staff of the Department by his high sense of duty, and by his unflagging devotion to the service of the Trustees. His long experience and sound judgment in all entomological matters rendered his advice invaluable to the Keeper, than whom no one could feel the loss of this loyal colleague more keenly. He maintained the collections entrusted to his care in an unsurpassed state of efficiency, and it will be a long time before the place which he occupied in science as an entomologist, more especially as one intimately acquainted with Hymenoptera, will be filled again. Shortly before his death he had completed the MS. of "Descriptions of New Hymenoptera," which was afterwards issued by the Trustees as a separate publication.

Mr. Smith was succeeded in the Assistant-Keepership by Mr. *A. G. Butler*, and the vacancy thus caused in the class of assistants was filled by the transfer of Mr. *W. F. Kirby* from the Science and Art Museum, Dublin, where he held a similar position; he was also the author of the Catalogue of the Hewitson Collection and of many papers on entomological subjects.

In 1881 the Department lost by death the services of Mr. *Arthur W. E. O'Shaughnessy*, an Assistant of the Second Class. Although officially placed at the disposal of the Superintendent, whenever this officer required assistance in clerical work, Mr. O'Shaughnessy was employed for many years exclusively on the collection of Reptiles and Fishes. He acquired considerable knowledge of these classes, and proved very efficient in his duties. At the time of Mr. O'Shaughnessy's death, Mr. *G. A. Boulenger*, a member of the staff of the Brussels Museum, was engaged in the study of the Batrachia, with the view of cataloguing that part of the collection. The Trustees had availed themselves of Mr. Boulenger's special knowledge in order to have the group re-arranged, and described in a new

1879-1881. edition of the Catalogue ; it proved to be the beginning of a
— long, most meritorious and beneficial service.

ARRANGEMENT OF THE COLLECTION.

(1879-81.)

In 1880 the rooms hitherto occupied by the Mineralogical and Geological Departments had been vacated, and the Trustees, anxious to begin contemplated alterations for a new Gallery of Sculptures, ordered the immediate removal of the zoological studies and study collections from the N.W. part of the building into the vacated galleries. The staff soon settled down in this temporary home, but the regular work of the Department was interrupted while the disturbance lasted. Nevertheless the work of systematic arrangement and cataloguing proceeded, and was directed to every part of the collection for which assistance was available. In the arrangement of the Mammals the Keeper now obtained help from Mr. Thomas, an Assistant appointed in 1878, who prepared a MS. list of Insectivora ; on the collection of Birds and Batrachia three ornithologists and one herpetologist had been at work ; accessions to the collection of Lizards were described by the late Mr. O'Shaughnessy ; the Crustacean family Idoteidæ was brought into complete order, with the assistance of the types in the Paris Museum ; specimens of the *Challenger* Collections (Echinoderms and Corals) which had been received were compared by Messrs. Bell and Ridley with the published Reports and incorporated ; the Nematoid Worms were catalogued in MS. by the late Dr. L. Örley, of Buda-Pesth, who devoted several months of a visit to London to this work. Finally the whole collection of microscopic preparations was classified and labelled ; it numbered 3500 slides, exclusive of more than 2200 Sponge slides, of which nearly the whole was derived from the Bowerbank Collection. This series was placed in suitable mahogany boxes, 111 in number.

In the Entomological branch only certain portions could be attended to. Many of the recent accessions were examined and reported upon by the entomologists, who in 1879 described 1244 new species from Museum specimens. The accessions to the order of Coleoptera consisted chiefly of specimens which had been authoritatively named by specialists, but the mere labour of arranging and incorporating many thousands of specimens, and eliminating duplicates, was more than could possibly be

accomplished by the one Assistant who, single-handed, had to 1879-1881. struggle with numerous previous arrears. Besides describing a number of new species, in order to preserve the possession of "types" to the Museum, he found time to arrange several smaller families. Mr. Kirby was instructed to continue F. Smith's work on Hymenoptera, and to arrange, name, and catalogue the specimens of the large family of Tenthredinidæ. The lepidopterist was, as regards accumulation and pressure of work, in an even worse position than his colleague for Coleoptera, as he had, during the absence of the Keeper, to attend to some part of the official and administrative business. Yet by descriptions in various papers he added, in 1881, 391 types to his collection. Lord Walsingham worked out and catalogued a collection of North American Tortricidæ which he had presented to the Trustees. The British Hemiptera Heteroptera had been very insufficiently represented in the gallery at Bloomsbury, and to supply this desideratum a carefully-named reference collection of these Insects was commenced for exhibition at South Kensington. For the re-arrangement of the Dipterous, Neuropterous, Orthopterous and Homopterous orders neither time nor working-power was available.

CATALOGUES.

(1879-81.)

Catalogue of Birds. Vol. 4. By R. Bowdler Sharpe. Pp. 494, with 14 plates. 1879.

Catalogue of Birds. Vol. 5. By H. Seebohm. Pp. 426, with 18 plates. 1881.

Catalogue of Birds. Vol. 6. By R. Bowdler Sharpe. Pp. 420, with 18 plates. 1881.

Illustrations of Typical Specimens of Coleoptera. Part I. Lycidæ. By C. O. Waterhouse. Pp. 83, with 18 plates. 1879.

This was the first and, unfortunately, the only part of a series intended to be a companion to the Illustrations of types of Moths. It was found that its preparation took up so much of the time of Mr. Waterhouse as seriously to impede the progress of the systematic arrangement of the general collection of Coleoptera, which work had been assigned to him as his special duty. No continuation of this series, therefore, was attempted.

Descriptions of new species of Hymenoptera. By F. Smith. Pp. 240. 1879. Published after the author's death from a MS. left by him.

- 1879-1881. Illustrations of Typical specimens of Lepidoptera Heterocera :
 Part 3. By A. G. Butler. Pp. 82, plates 41-60. 1879.
 Part 4 (North American Tortricidæ). By Lord Walsingham.
 Pp. 84, plates 61-77. 1879.
 Part 5. By A. G. Butler. Pp. 74, plates 78-100. 1881.

GROWTH OF THE COLLECTION.

(1879-81.)

In these three years three very large collections (*East India Museum*, *Gould* and *Hewitson* Collections) came into the possession of the Trustees, swelling the total increase to 119,766, or an annual average of 40,000 specimens. Apart from those large accessions, the annual average would be 24,400, or about the same as in the last seven years.

1. In 1879 the remainder of the Zoological Museum of the late *East India Company* was transferred to the custody of the Trustees, a portion having been previously received in 1860. On the present occasion the donation was accompanied with the documents relating to the specimens. Such specimens only as were actual desiderata of the British Museum, or to which historical interest was attached, were retained and incorporated, viz., 672 Mammals, 6409 Birds, 28 Tortoises, 125 Fishes, 217 Molluscs, 83 Crustaceans, 1813 Insects, and 52 Radiates. By the desire of the Secretary of State for India a great portion of the economic products were transferred to the South Kensington Museum, and the other duplicates distributed among six other museums whose principal object is the advancement of the natural history of the Indian Empire.

2. In the same year the Lords of the Admiralty presented the first consignment of the collections made by Staff-Surgeon *R. W. Copping* during the survey by H.M.S. *Alert* of the southern extremity of South America. A fuller reference to these valuable collections is made below (p. 63).

3. Mr. (afterwards Sir) John Murray delivered now in continuous succession the *Challenger* collections as soon as he received them from the specialists entrusted with the Reports. Between 1879 and 1881 the following were received: 661 Shore-fishes, 795 skins and 226 eggs of Birds, 919 Ostracoda, 944 Deep-sea Corals, 160 Pennatulida, 584 Echinoidea, and 197 Pycnogonida.

4. A complete set of the animals collected by Prof. *I. B. Balfour* in the Island of Socotra was presented by the Socotra Committee of the British Association.

Each of the remaining acquisitions contained specimens of 1879-1881.
one class only :—

5. An adult Fin-whale (*Balænoptera musculus*), which stranded on the Scotch coast, and was exhibited in the flesh for some time at Birmingham, was purchased for £100 ; it was thus possible to secure a very complete Whale-skeleton for the Cetacean room in the new Museum.

6. One of the most important acquisitions was the collection of Birds formed by the late Mr. *John Gould*, F.R.S. It consisted of 12,395 specimens, and contained a large number of the objects described and figured in his various great works. Of special value in this acquisition was the series of Humming Birds, which consisted of 5378 specimens, partly preserved as skins, partly mounted and grouped in the cases in which they had been shown to the public at the first International Exhibition in 1851. They were the favourites of their former owner, and were brought together by forty years' careful collecting, regardless of expense. The price paid for the entire collection was £3000.

The series of Humming Birds which had been in the Museum previously to this purchase was very poor, and scarcely sufficient to serve in the gallery as a representation of this order of Birds. It was rarely added to by G. R. Gray, in obedience to a wise rule of Dr. Gray, who abstained from competing with private collectors for the purchase of specimens in which they were specially interested. It was desirable that a portion of the new acquisition should be exhibited to the public without delay ; and for this purpose the sixty-six glass cases in which the groups were mounted were repaired and placed on suitable stands. With the sanction of the Trustees the ornithological Assistant was instructed to prepare, under the Keeper's supervision, in extra-official time, a descriptive guide to the exhibition for the use of visitors.

Other important additions to the Bird collection were :—The donation by Messrs. *Godman* and *Salvin* of their collection of Old-World and Australian Birds, 3397 specimens ; and, by purchase from the *Eyton* Collection, 71 types of Birds, and 108 skeletons, the majority of which had been figured by this ornithologist in his "Osteologia Avium."

7. 277 Shells, including a great number of types described in the Voyages of H.M.S.S. *Sulphur*, *Samarang*, etc., were selected from the collection of the late Mr. *Lombe Taylor*.

8. The Entomological Section received accessions of extraordinary value and magnitude. The late Mr. *William Chapman*

1879-1881. *Hewitson* bequeathed to the Trustees his celebrated collection of Exotic Butterflies; it consisted of 24,625 specimens referable to 5795 species, and including numerous types described by the testator in his "Exotic Butterflies" and "Diurnal Lepidoptera." The collection was in a perfect state of arrangement and preservation, and, by Mr. Hewitson's direction, a catalogue of its contents was prepared and printed at the expense of his estate. The Trustees accepted a condition attached by the testator to his bequest, viz., that the collection should be called the "Hewitson Collection," and that the specimens should be kept in good order, preservation and condition, and in the same cabinets, and in the same order and arrangement, and under the same nomenclature, as they should be in at the time of his decease, until the expiration of twenty-one years from that time.

Other important collections of named *Lepidoptera* were acquired by purchase: the *Wollaston* Collection of St. Helena *Lepidoptera* (364 specimens); the first half of the *Grote* Collection of North American *Lepidoptera* (3247 specimens); a selection of 1062 specimens from the *Lidderdale* Collection made in Sikhim and Bhotan. Lord *Walsingham* presented 476 specimens of North American Microlepidoptera, including the types of 118 new species, described by him in the fourth part of the "Illustrations."

9. Dr. *J. S. Baly's* collection of Phytophagous, and Mr. *Frederick Bates'* Heteromerous, *Coleoptera* were purchased in instalments: the portions purchased of the former amounted to 9898, and of the latter to 8602 specimens, mostly named.

10. The late Mr. *F. Smith* left a collection of *Hymenoptera* which he had formed before entering the service of the Trustees; a selection of 3445 specimens, including 554 types, was purchased, as was another selection of 7898 named specimens from *H. Buchecker's* collection of Swiss species.

Although the accessions of these three years to the Entomological Section amounted to the very large number of 77,000 specimens, and, therefore, might appear to have added greatly to the difficulties with which the entomological staff had to contend, it should be remembered that some 60,000 had been examined and named by their former owners, who were authorities in their special branches. Therefore these acquisitions, on the other hand, facilitated the determination and arrangement of unnamed material, and involved not much more work than that of incorporating them. As mentioned above, the lepidopterist was saved this work as far as the Hewitson Collection was concerned,

but the coleopterist was unable to cope with the additions to his 1879-1881. branch.

CENSUS OF THE COLLECTION.

(1879-81.)

In 1862 Dr. Gray estimated the number of specimens in the Zoological Department at 629,000 (Parliamentary Return, 11th March, 1864). This estimate, apparently made up from the registers of accessions, which before his time were not kept with strict accuracy, was clearly below the truth, and was corrected by him in 1868 by an actual census, when the number of specimens was found to be close upon 1,000,000. In 1880 his successor arranged for another census, which resulted in a total of 1,300,000 specimens.*

With regard to arrangement and other work entailed by the accessions, it is evident that the working staff of nine persons (inclusive of the Keeper), which was inadequate for coping with a growing collection of 1,000,000 specimens in 1868, could not be regarded as sufficient for 1,300,000 in 1880, even after one Assistant of the second class had been added to its numerical strength. In fact, the increase of every branch of the Department demanded greater specialisation of the work; one Assistant, who hitherto had taken charge of two or three divisions, was no longer able to do justice to the collections under his charge. Certain parts, especially in the Entomological section, had grown to such an extent as to keep two or three Assistants fully occupied. The Keeper took every opportunity of urging the Trustees to apply to the Treasury for suitable additions to the staff: not only to the higher rank of Assistants, but also to the lower grade of employés who would help the former in performing mechanical work. It was encouraging for future efforts in the same direction to obtain the sanction of the Treasury for the appointment of two Boy-attendants and a taxidermist.

DUPLICATES.

(1879-81.)

Exchanges, in which Duplicates were utilised, were now and then made—in fact, a small number suitable for the purpose had been set aside; but altogether this source of acquisition was not very fertile, nor was it much encouraged—it is costly, on account

* This number had increased to 2,245,000 in 1895 (see p. 97).

1879-1881. of the labour and time it entails, and not always equally satisfactory to both parties.

The acquisition of duplicates was always carefully avoided, but whenever large miscellaneous collections were received either as donations or as purchases, a small number of specimens proved to be absolutely useless for the Museum, and they were set aside, without being entered in the registers. During the progress of the catalogues duplicates were also weeded out of the general collection. The "Transit of Venus" collections and those received from the East India Company contained a large number of such specimens, which were distributed among certain Museums by the desire of the donors; and as the Trustees had received applications from several other Museums and Institutions for duplicates, they decided to deal in a similar manner with the stock which had accumulated in the course of time.

The list of applicants soon comprised, beside the Museums of Edinburgh and Dublin, a number of provincial and colonial Museums; the Trustees therefore sanctioned some rules by which the distribution was to be regulated, the principal ones being (1) that when a sufficient number of duplicates are available for distribution the applicants should be invited, in rotation, to make their own selection; (2) that in inviting applicants preference should be given, as a general rule, to priority of application; (3) that the recipient should remove the selected specimens at his own expense; (4) that the recipient should engage to return to the Trustees any specimen which might have been placed inadvertently among the duplicates, or which should afterwards prove to be a desideratum in the British Museum.

Henceforth, almost every year duplicates were disposed of in this manner. In 1880 and 1881 21,779 duplicates, of which about 14,500 were Insects, chiefly Coleoptera, were given to the Museums of Edinburgh and Dublin, seven provincial Museums and the Museum at Cape Town.

STUDENTS AND VISITORS.

While the Natural History collections were still at Bloomsbury, the official annual returns of the number of students included also persons who on private days visited, by special permission, the public galleries. Many of them, indeed, were *bonâ fide* students. The number of visits by students and visitors rarely reached 4000 per annum, but in 1881 it rose abruptly to 7407. This increase was evidently due to the

attraction of the exhibition of Gould's Humming Birds and the 1879-1881. groups of Nesting British Birds.

GRANTS FOR ANNUAL EXPENDITURE.

(1879-81.)

The grants varied in these three years: they amounted, for purchases, to £1000, £1200 and £1200 respectively; for preparing, to £772, £944 and £900; for preparing and printing catalogues, to £900, £900 and £1100.

THE NEW MUSEUM.

(1879-81.)

The progress of the fittings for the zoological galleries and rooms, which had slackened in 1879, was accelerated by an appeal of the Trustees to the Treasury, and by the end of 1880 all the plans of the cases had been passed by the Keepers. Estimates were prepared for the spirit building; in spite of the simplicity of its construction, and of the inexpensive character of the internal fittings, the estimates amounted to £17,043 for the building, and £3509 for the cases.

Index Museum and Guide-books.—The Trustees obtained the opinion of the Keepers about the so-called "Index Museum" projected by the Superintendent. It was devised to form, for the instruction of the visitors, an epitome of the exhibitions spread over many large galleries, and bewildering by their variety and magnitude; it would include representatives of all the most remarkable types exhibited in the Museum. Only one of the four Keepers (Botany) supported the scheme. The Keeper of Zoology took this opportunity of submitting to the Trustees that, combined with a more elaborate system of labelling than had been in use at Bloomsbury, "guide-books" would fully supply the advantages to be gained by a separate exhibition of types in the "Index Museum." He did not advocate the crowding of labels into the cases. The American system of having "a collection of labels illustrated by specimens" seemed to him a mistake. What he recommended to the Trustees was this:

"To render the exhibition-series in every way instructive, Dr. Günther proposes that a more perfect plan of labelling throughout the collection be introduced, and that a new guide-book should be prepared. A clearly written guide, well illustrated

1879-1881. with wood-cuts, will supply all the information useful to the public and draw their attention to the more remarkable types. As the different divisions of the animal kingdom will be separated in distinct rooms, it will be possible to prepare this guide on an entirely different plan from that at present in use at the British Museum, viz., in the form of a popular, but systematic handbook of Natural History."

It may be mentioned here that this plan was successfully carried out in subsequent years, with the modification that a separate guide for each gallery was prepared. These guides were not only satisfactory to visitors to the Museum, but hundreds of copies were disposed of to serve as useful handbooks in schools in which Natural History instruction had been introduced.

The Trustees sanctioned Professor Owen's proposal to proceed with the formation of the Index Museum as devised by him, but its aim and constitution were greatly altered in subsequent years.

THE DEPARTMENTAL LIBRARY.

(1879-81.)

A commencement of the formation of a Natural History Library could be made in 1880, the Treasury allowing the unexpended balance of the general grant for the preceding year (£5700) to be devoted to the purchase of books, and making a further grant of £5000 for each of the five following years. The Trustees approved of the plan of forming a distinct general library, in which works for the use of more than one Department should be collected, besides the four special departmental libraries. The selection and acquisition of such general works were left to the judgment of the Keepers, but to prevent duplication of purchases as well as to serve as a temporary guide for zoological acquisitions, Dr. Günther prepared the first catalogue of the books in the Zoological Department, with the help of John Saunders, a most able attendant of long standing in the department; it comprised 1700 titles, including 182 works purchased with the share of the Department in this year's surplus (£2231). None of these books were of an earlier date than 1820.

1882-83.

In the course of these two years the zoological collections were removed into their new home at South Kensington. The removal was carried out intermittently, the sequence in which the several collections followed one another being determined by the requirements of the architectural alterations in the old building as much as by the state of preparedness of the new galleries. Thus, in the intervals of the removal, some members of the staff were able to proceed with their ordinary duties, and a short notice of the work done independently of the removal will be inserted here, and will be followed by a connected description of the removal itself.

ADDITIONS TO THE STAFF.

The Treasury gave their consent to the appointment of a First-class Assistant for the care of the collections of Reptiles and Fishes; the Principal Trustees appointed Mr. *G. A. Boulenger*, who had been working at these collections for more than a year. This appointment was most opportune, as an experienced Assistant was much required for the removal of the spirit-collection and its rearrangement in the new spirit-building.

The Treasury also sanctioned the addition of two Second-class Assistants to the staff, and the Trustees appointed to these posts Mr. *W. R. Ogilvie-Grant* and Mr. *J. J. Quelch*; the latter was directed to engage in the study of the Anthozoa, Hydrozoa, and Polyzoa, so as to allow Mr. Ridley to give more of his time to the arrangement of Sponges. Mr. Quelch resigned his post in 1886 having been appointed to the curatorship of the Museum of Georgetown, British Guiana. Mr. Ogilvie-Grant, not long after his appointment, was definitely transferred to the Bird Room, where additional help was urgently required.

To assist in mechanical labours, two other Boy-attendants and an Articulator were added to the Department.

The Trustees made a most beneficial change in the duties of the Attendants (thirteen in number) in the new Museum. At Bloomsbury the majority of these men had been employed chiefly in guarding and cleaning the galleries and dusting the cases. They were now relieved of this duty, and became available for direct assistance in the work on the collections. They were an intelligent and trustworthy body of men and gladly welcomed this change; they were assigned to the various branches of the Department, and, under the instruction of the Assistants, soon

1882-1883. acquired not only skill in manipulating specimens, but considerable knowledge of the collections; some were very useful as writers or copyists. Two of the Boy-attendants were employed in the Insect Room for setting specimens, etc.

ARRANGEMENT AND CATALOGUES.

(1882-83.)

The arrangement of the collections of Birds and Batrachians proceeded *pari passu* with the progress of the catalogues; all the members of the staff were occupied for a longer or shorter time in the examination and description of the collections received from the *Alert*, and in preparing a report for publication. In the Entomological section the work of arranging was much interfered with by the removal; yet, by description of new species, 340 types were added in the Lepidopterous series alone. Satisfactory progress was made in the arrangement of the Polyzoa, Coelenterata, Sponges and Protozoa, this work being carried on chiefly with the view of separating from the study collection a well-named and representative series for exhibition in the new gallery. The arrival of the magnificent collection of Reef-corals brought together during the voyages of the *Challenger* and *Alert*, and of many perfect examples from Mauritius, was very opportune.

The following Catalogues were published:—

Catalogue of Birds. Vol. 7. By R. Bowdler Sharpe. Pp. 698, with 15 plates. 1883.

Catalogue of Birds. Vol. 8. By H. Gadov. Pp. 386, with 9 plates. 1883.

Catalogue of Batrachia Salientia. Second edition. By G. A. Boulenger. Pp. 503, with 30 plates. 1882.

Catalogue of Batrachia Gradientia and Apoda. Second edition. By G. A. Boulenger. Pp. 127, with 9 plates. 1882.

GROWTH OF THE COLLECTION.

(1882-83.)

A comparison of the second edition of the Batrachian Catalogues above referred to with the first edition published in 1850 and 1858, shows the growth of this branch of the collection within the years of publication. The numbers of species and specimens (all preserved in spirit) were:—

Of *Batrachia Salientia*—

in 1858	in 1868	in 1882	1882-1883.
214 species and 1691 specimens	313 species	522 species and 4692 specimens.	—

Of *Batrachia Gradientia* and *Apoda*—

in 1850	in 1882
72 species and 199 specimens	143 species and 1137 specimens.

The total number of acquisitions in these two years amounted to 51,348 specimens :—

1. The Lords of the Admiralty presented two valuable collections : one made by Mr. *H. B. Guppy* during the voyage of H.M.S. *Lark* in the Solomon Islands ; the other by Mr. *W. D. Wodsworth* during the voyage of H.M.S. *Sylvia* in various localities.

2. Of the *Challenger* Collection were received : 24 Mammalia, 194 Reptiles, 50 Batrachians, 1000 Ophiuroidea, 32 anatomical preparations of Mammalia, 213 Lepidoptera, 81 Elaspoda.

3. On the close of the *International Fisheries Exhibition* a large number of most valuable objects (marine and freshwater) were presented to the Trustees by the Commissioners of the U.S. of America, the Governments of the Madras Presidency, Singapore, Jamaica, New South Wales, the Hawaiian and Chilian Governments, and the Agents for the Chinese Court.

4. A collection of specimens of all classes of animals, made by Mr. *H. O. Forbes* at Timor Laut, was presented by a committee of the British Association.

5. A collection made by the Rev. *W. Deans Cowan* in Madagascar, and comprising 34 Mammals, 550 Birds and eggs, 73 Reptiles, 89 Batrachians, 77 Shells, 83 Crustaceans, 223 Arachnids, and 879 Insects, was purchased.

6. A collection of the Birds of Pegu (1544 skins, etc.) formed by Mr. *E. W. Oates*, purchased.

7. Very valuable specimens of large Mammals, to be added to the exhibition-series in the new Museum, were acquired by purchase : two Tigers, one from Astrabad, the other from the Garo Hills ; two Elks from Russia ; the skeleton of a tuskless Indian Elephant ; an adult Hippopotamus ; and others.

Other important collections consisted of Lepidoptera only :—

1. The purchase for £377 of the collection formed by Prof. *P. C. Zeller* was spread over two years (1883-4) ; it contained more than 31,000 Macrolepidoptera of Europe and North

1882-1883. America in an excellent state of preservation, systematically arranged and named.

2. The purchase of the *A. R. Grote* Collection of 6054 North American Lepidoptera was also spread over two years (1881-2); the specimens had been named and arranged, and many of them were types

3. A collection of 642 Chilian Lepidoptera, which included the types of about 230 new species, was presented by the collector, Mr. *Thomas Edmonds*.

Finally, 133 *Deep Sea Sponges*, the proceeds of the cruise of H.M.S. *Porcupine* in the North Atlantic (1869-70), which had remained in the care of the late Prof. Sir Wyville Thomson, were delivered by his executors.

The Zoological Department had already in its charge several valuable collections of original drawings of animals. Two magnificent additions by transfer from the Department of Manuscripts were received, viz., *J. Abbot's* original drawings of the Insects of Georgia in seventeen volumes, and Major-General *T. Hardwicke's* drawings of Indian animals in thirty-three volumes. Both these collections had been constantly referred to by members of the staff, and would have been greatly missed if they had been left at Bloomsbury.

DUPLICATES.

(1882-83.)

In the course of 1882, 13,380 duplicate specimens were distributed among eight institutions (viz., 171 Mammals, 852 Birds, 250 Reptiles, 311 Batrachians, 272 Fishes, 3203 Molluscs, 314 Crustaceans, 7498 Insects, 186 Echinoderms, 323 Corals and Sponges). All the applicants who had established a claim for the reception of zoological duplicates, and were on the list of the Trustees, had now been admitted for selection of specimens specially required by them.

In 1883, 16,332 specimens were given to six institutions which headed the list, and therefore were now supplied with a second consignment. The specimens delivered to them consisted of 91 Mammals, 1409 Birds, 4107 Birds'-eggs, 129 Reptiles, 137 Batrachians, 453 Fishes, 8245 Molluscs, 162 Crustaceans, 1467 Insects, 32 Echinoderms, and 100 Corals and Sponges.

The latter distribution had nearly exhausted the stock of duplicates (except Coleoptera), so that some time was allowed to elapse before this service could be resumed.

GRANTS FOR ANNUAL EXPENDITURE.

(1882-83.)

The grants for purchases were £1300 in both years; for 1882-1884. preparing, etc., £1600 and £820; for preparing and printing catalogues, £1100 and £900; for zoological books, £3000 and £2500; for binding books, £250 in each year.

DEPARTMENTAL LIBRARY.

(1882-83.)

With the grants mentioned above good progress could be made in the formation of the Departmental Library. The second edition of the Zoological Catalogue (1882) contained 2638 titles, which number had risen to 5362 at the end of 1883, calling for the issue of a third edition. The work connected with this service had devolved chiefly upon the Keeper, but required now more time than he could spare, as the selection of subsequent purchases became more and more difficult, and the collation and supervision of binder's work required greater attention. The Trustees granted him, therefore, for this duty the temporary assistance of Mr. *J. E. Harting* as librarian of the Zoological Library; for several years, in fact almost until the time arrived when the extraordinary grant by the Treasury was exhausted, Mr. Harting attended to this duty. During 1883 the Keeper of Zoology had also to undertake the control of the General Library, of which a catalogue on the plan of that for Zoology was prepared.*

THE REMOVAL AND REARRANGEMENT.

(1882-84.)

Towards the middle of 1882 two of the galleries in the new Museum, the western gallery of the second floor and the Cetacean room in the basement, were so far completed that a beginning could be made with the removal of the zoological collections. The osteological specimens, the study-series of Mammalia, the entire collection of Mollusca, with a part of the Corals and Sponges, were the first to be removed and deposited in the galleries destined for their reception. Some other collections which had to be removed on account of building

* These catalogues of books were intended and prepared merely for temporary departmental use, and no attempt was made at giving the titles in their bibliographical completeness.

1882-1884. operations in the old Museum, viz., the spirit-specimens of Mammals, Birds, and Invertebrates, the dry specimens of Reptiles and Fishes, had to be temporarily stowed away in the new building until certain rooms were ready for their reception. The part removed in that year constituted about one-fourth of the entire collection.

The operations were suspended during the winter months and resumed in March, 1883. They continued intermittently to the end of August, when the actual work of removal was completed. This occupied altogether 97 days, on which 354 journeys were made by the vans engaged. The collections were removed, either packed in specially constructed boxes or trays, to the number of 5171, or as single specimens, of which there were 1348. The spirit-collections were contained in 52,635 bottles. The number of cabinets taken with the collection from the old Museum amounted to 350, and that of other pieces of fittings and furniture to 1348.

Excepting an insignificant amount of deterioration, which was unavoidable from so general a disturbance, and which is fully compensated for by the thorough examination to which every part of the collections was subjected in detail, no specimen of any value suffered serious injury, save a *Pentacrinus*, which could be replaced without great difficulty. A number of very delicate and fragile specimens, which might have suffered by being sent in the vans, were conveyed by hand or in cabs.*

The Keeper and the staff were gratified by the receipt of a copy of the following minute (dated October 13, 1883): "The Trustees, having had before them a report by the Principal Librarian of the successful removal of the zoological collections to the new Museum without any accident of importance, and of the rearrangement of the specimens, carried out in a great measure simultaneously by carefully considered measures, the Principal Librarian was instructed to convey to Dr. Günther and his staff their sense of the forethought and care shown in the direction of the removal and of the zealous assistance of officers and attendants in effecting it."

* Serious difficulties were experienced with very few objects only, such as the large Basking Shark, the skin of which had become very brittle in drying, and was likely to crack from a jar or from pressure. To release two whales' skulls (of a Greenland Right Whale and a Sperm Whale), a brick wall had to be taken down which had been built across the recess in the vaults in which they had been deposited at the time when they were withdrawn from the exhibition in Montague House. They are two of the oldest objects in the Department, and had not seen daylight since they had been figured by Cuvier in his "*Ossements Fossiles*," vol. v.

The rearrangement of the collections was begun during the 1882-1884. removal. In fact, careful plans of the galleries had been prepared before the removal, showing in detail the disposition of the contents of each exhibition, and particularly of the large objects and separate show-cases occupying the floor between the fixed cases. Thus most of the contents of every van-load could be moved into their permanent position as soon as they arrived at South Kensington, but in some of the galleries the work of rearrangement occupied a much longer time than was anticipated, owing to various circumstances. Thus in the Shell Gallery the repairs of the old table-cases necessitated a double removal of the 3200 drawers and the 28,000 tablets belonging to the collection of Shells. In the Fish Gallery a similar cause, combined with an influx of a great number of late additions, retarded the completion of the work. In the Insect and British Galleries new exhibition-series had to be formed, and of course many modifications of the original plans suggested themselves during the progress of the work.

The *Osteological Gallery* was the first to be arranged; it was selected for the reception of the whole of the osteological preparations of terrestrial Mammalia. This gallery, on the second floor, corresponds in length and width to the Mammalian Gallery immediately below, which was chosen for the exhibition of the stuffed specimens, but it is intersected by twelve iron girders which support the roof. Being lit from above as well as from the sides, it offers a great amount of sunlight, a condition particularly beneficial to the appearance and preservation of mounted skeletons. The gallery was furnished with twenty-four exhibition cases of a \square -like shape, projecting 14 feet into the room and hiding the lower half of the girders. The space within, and surrounded by the three sides of, each case was furnished with two cabinets containing the non-exhibited portions, viz., skulls and loose skeletons as well as the skins of the same species or genera. In the exhibition was now also introduced a representative series of the few anthropological specimens in the collection. Hitherto no effort had been made to form an anthropological collection in the Museum. The Royal College of Surgeons had paid special attention to this subject for many years, and had brought together an unrivalled collection of human crania and skeletons, so that it seemed a duty to assist, rather than to compete with, them in its further development. The duplication of such a collection in London would have been of doubtful advantage, even if the Zoological Department had had sufficient room and means for

1882-1884. forming it. Therefore, it was considered best to represent Man by some typical specimens, and to limit the further increase to acquisitions by donation.

The saloon at the western end of the gallery was devoted to skeletons of the largest terrestrial Mammals, especially a magnificent series of the living species and races of the Elephant, which could thus be studied side by side: they comprised complete skeletons of a tusked and tuskless variety of the Indian species, of the Sumatran race and of the African species, besides skulls, each of some special interest.

The *Cetacean* Room, with its annexe for non-exhibited specimens, has already been noticed (p. 38); the mounting of the large skeletons naturally took some time, but both this room and the Osteological Gallery were sufficiently advanced to be opened to the public in April, 1883.

The Mammalian, Bird, Reptile, Shell, Starfish and Coral Galleries were opened to the public in quick succession in the same year. Owing to the long preparation at Bloomsbury the specimens could be distributed in the cases and arranged in systematic order without great difficulty. With few exceptions, badly stuffed examples had been weeded out, but some which could not be replaced, as, for instance, the Antarctic Seals, Penguins from the collection of the *Erebus* and *Terror*, continued to form part of the exhibition, after having undergone the process of cleaning and remounting. The exhibition in the Mammalian Gallery included an unrivalled series of Wild Cattle, Wild Sheep and Goats, Antelopes, and Rhinoceros. None of the exhibits of any size, except the very largest like the Giraffe, were allowed to be exposed to the deteriorating effect of dust, and, consequently, of the frequent application of the dusting brush; all of them were enclosed in special cases, or in pier cases which had been so constructed that the central wooden partition could be taken out, giving a width of five feet; by this arrangement the specimens could be viewed from every side. The skins and mounted specimens of large size, which belonged to the study-series, were stored in a large room in the basement.

The saloon of the *Bird Gallery* was occupied by the Struthious Birds, including the fine series of Cassowaries, and, at a somewhat later period, by some of the larger groups of British Nesting Birds, which gradually extended along the whole length of the centre of the gallery. To the immense collection of Birds'-skins, then about 90,000 in number, besides eggs, a separate room, the *Bird Room*, almost contiguous with the exhibition gallery, was

allotted. This room was at first fitted with seventy-six cabinets, 1882-1884. in accordance with the estimate made in 1876, but so rapid had been the increase of this collection within the last seven years that additional cabinets were urgently required. The drawers with which the cabinets were fitted are of different depths, the depths being multiples of a certain unit, so as to be interchangeable not only between different cabinets, but also within the same cabinet.* The skins are kept in glass-topped boxes of various sizes, but also multiples of a unit. By this plan great economy of space, easy shifting of any part of the collection, and, above all, security from dust and insects were effected. The Bird Room also served as a work room for two Assistants, one Attendant, and the visitors who studied any part of the collection.

The exhibition in the *Reptile Gallery* left much to be desired. The almost insuperable difficulties of preserving Lizards or Snakes in a dried state without distortion of their natural features, and reluctance to bringing any number of specimens in spirit into the main building, caused this exhibition to be very incomplete. Tortoises and Crocodiles were represented on a much more liberal scale: the latter being now placed on the floor, where they could be examined, instead of on the top of the cases, as in the old Museum. Of the former the unique series of Giant Tortoises could be shown in its completeness.

The arrangement of the *Fish Gallery* was delayed by the non-delivery of cases required for recent acquisitions, and could not be opened to the public until 1885. This was not to be regretted, as opportunity was thus given to make a more strict selection of the specimens in the wall-cases. As the ornamental colours of stuffed fishes nearly always disappear, some suitable examples were experimentally painted from drawings of the living fish to show the gorgeous coloration of the Coral-fishes and Wrasses of the Tropics. This spacious gallery also afforded room for showing a series of the various types of Sharks, and other large fishes, of which only small and undeveloped individuals are generally preserved in Museums. Seven table-cases contained the skeletons and unmounted skins of species of small or moderate size in closed drawers.

The bulk of the study collection of Reptiles and Fishes, which were preserved in spirit, were deposited in the Spirit Building, of which a short description will be given further on. The

* The principle followed in the construction of this type of cabinet was first used by Messrs. Salvin and Godman for this collection of Birds.

1882-1884. arrangement of these specimens was completed without difficulty almost as soon as they arrived at their destination.

The *Shell Gallery* was devoted exclusively to Mollusca, and afforded sufficient room for the exhibition-series as well as the study-collection. The majority of the table-cases came from Bloomsbury, and were placed in twenty-six blocks. The arrangement of the collection underwent no particular change, and seemed to fulfil all the requirements of the public and the numerous visitors with whom shells are a favourite study.

Insect Gallery.—One of the narrower northern galleries appeared to be quite roomy enough for an exhibition of a general representative series of Insects and the other Articulata. Its arrangement was still in a backward state at the end of 1884. The entomologists, particularly Mr. Waterhouse, gave much time to it, but were frequently interrupted by other more pressing duties. Nearly the whole of the specimens exhibited in the old building were faded or otherwise deteriorated, so that the formation of a new and more representative exhibition had become a matter of necessity, and, indeed, had been already commenced in the old building; but thousands of specimens had to be set and provided with printed or fairly written labels. Besides, the gallery was intended to contain an exhibition illustrating the life-history and metamorphoses of representative or important forms. The collection and selection of suitable materials for this object, their mounting on models of the food-plants, etc., was an undertaking admitting of but slow progress.

The *Starfish Gallery*, so called from one of the best-known types of the *Echinodermata*, was fitted out not only for an exhibition of the animals of this class, but also for the heterogeneous assemblage of creatures popularly comprised under the name of *Worms*. As these animals possess greater attraction to the scientific student than to the general public, and as many, from their small size or the soft nature of their body, are not fit for exhibition, no attempt was made to show more than a selection of types of the great divisions of "Vermes." But, besides a very complete series, supplemented by models or figures, and illustrating the remarkable life-history of some of these animals, specimens of all those which possess a special interest from their relation to man, were also shown. The arrangement of this gallery (completed in 1886) was entirely the work of Mr. F. J. Bell, the Assistant in charge of this section of the Department.

The dried specimens of the study-series of these animals were

placed in the drawers of the table-cases, while those preserved in spirit were deposited in the Spirit Building in a fair state of arrangement. 1882-1884. —

The *Coral Gallery* is a long gallery, 210 feet by 18 feet, running parallel to the Bird Gallery and situated between it and the northern galleries. Its architecture offers peculiar advantages for an effective display of the wonderful variety of structure of Corals and Sponges; Polyzoa, Hydrozoa, and Protozoa occupied the terminal compartments of the same gallery. Of these compartments there were six, formed by pier-cases projecting into the gallery. The pier-cases have both fronts glazed, so that the contents can be viewed from every side; the shelves are also glass, instead of wood as in the other cases. The floor of the gallery was occupied by table-cases and magnificent examples of large Coral-colonies. The table-cases of this gallery as well as an annexe offered sufficient room for the non-exhibited portions of these collections.

The saloon behind the "Index Museum" had been set aside for the collection of *British Animals*. In its composition this exhibition was intended to differ greatly from that of the other galleries, inasmuch as it should not be merely representative of the higher groups, but should embrace, if possible, all the species and varieties of animals found within and around the British Islands. It is the collection to which here, as in the Museum at Bloomsbury, the large number of visitors resort who seek recreation from their daily toil in collecting specimens of Natural History of some kind, and to whom this occupation is as fascinating as sport to the higher classes of the community. Many wish to obtain the proper names for their captures, and visit the Museum solely for that purpose. Nearly the whole of this exhibition had to be formed anew; Vertebrates gave comparatively little trouble, but the Insects and Shells required a great deal of labour. All the specimens of the latter class had to be removed from their old faded tablets to which they had been glued, cleaned and remounted upon dark paper in glass-topped boxes, which were so arranged in the cases that the smaller species could be examined with an ordinary lens without the cases being opened. Although the mechanical work could be done by Attendants, labelling, selecting, arranging the specimens, and supervising the work were the duty of the Assistants, and occupied them long after the saloon had been opened to the public in 1886 (July 8th).

The *Insect Room* consisted of a suite of four rooms in

1882-1884. the basement, along the southern side of the building, with an area more than twice that of the room at Bloomsbury. The rooms were lit by windows on one side only, but afforded sufficient working accommodation for the staff and students. The different parts of the collection, as well as of the entomological Library, could be segregated so as to be near the several workers, and the Attendants engaged in setting insects were under the direct supervision of the Assistants. The only difficulty experienced at first arose from the heating apparatus, which for some time caused the temperature to rise so as to endanger the preservation of the specimens.

In the construction of the *Spirit Building* the principal object, to provide a safe fireproof store-room for all the specimens preserved in spirit, was kept in view. It was a simple quadrangular brick building, 119 ft. long and 47 ft. broad, with a flat cemented roof. Its greater part consists of the store room, which is separated by a passage from the suite of work-rooms, and not heated. A row of side-lights above the wall-cases, and some 15 ft. above the outside ground, admit sufficient light for the arrangement of the bottles, but not for examination or research, for which the work-rooms have been designed.

The wall- and upright cases are 10 ft. in height and have an aggregate length of 740 ft.; in order to preserve the specimens from the deteriorating effects of light, the cases are provided with wooden doors. The floor of the building is occupied by cross-rows alternately of 10 ft. cases, and of lower cases 4 ft. in height, which serve as a substitute for tables, and in which the animals other than Reptiles and Fishes are arranged; to economise space these lower cases are shut by sliding doors.

With the object of combating an outbreak of fire a number of hydrants, with sprinklers at the end, project at short intervals from above the cases into the room; the water can be turned on from the outside of the building, so that cases and room can be flooded without delay. Besides, a row of cast-iron gratings is let into the cemented floor, and runs along the base of the cases, permitting spirit which would be set free from bursting bottles to flow into the space below the building, which is filled with sand and shingle to the depth of several feet.

A room in the basement was furnished for the reception of those books of the Departmental *Library* which were not distributed among the work-rooms of the Assistants, and served also as an office for the Zoological Librarian and his Attendant. Five of the Assistants had separate rooms in close proximity to the

collections of which they were severally in charge, the Entomologists and Ornithologists working in the Insect and Bird Rooms. Finally, a large room in the basement was fitted up for the Articulator, the Taxidermist, etc., and another for the Departmental carpenters.

1884-85.

GUIDES AND CATALOGUES.

The time had now arrived to prepare the "Guides" on the plan adopted some years back. The Keeper proposed to the Trustees to prepare the guides with a twofold object: they should not only fulfil the primary purpose of serving as guides to the public during their visits to the Museum, but also retain their usefulness as short instructive popular expositions of the animal kingdom, illustrated with woodcuts representing certain of the most important types or remarkable objects, and with plans of the galleries. He further proposed that separate Guides to the different Zoological Galleries should be prepared, viz. :—

1. Guide to the Mammalian, Osteological, and Cetacean Galleries, giving a short and comprehensive account of the class Mammalia.
2. Guide to the Bird Gallery, with the Guide to the Gould Collection of Humming Birds as an appendix.
3. Guide to the Reptile and Fish Galleries.
4. Guide to the Shell and Insect Galleries.
5. Guide to the Starfish and Coral Galleries.
6. Guide to the British Saloon, with a descriptive list of the groups of British Birds as an appendix.

This proposal was sanctioned by the Trustees, and the Guide-books to the Mammalian, Reptile, Shell, and Starfish Galleries were completed or taken in hand in the present and following years.

Since the first consignment was received from H.M.S. *Alert* in 1880 (mentioned above, p. 44), further collections made during the surveying voyage of the same ship in Australia and the Western Indian Ocean were sent in by the Lords Commissioners of the Admiralty. These collections were so extensive and important that the Trustees sanctioned the Keeper's proposal to prepare a full account of them in the form of a separate volume. The work of examining the collections had proceeded during the last three years, but the completion and publication of the Report was delayed by the removal of the Department.

1884-1885. Irrespective of a number of specimens set aside as duplicates, not less than 3700, referable to 1300 species, were incorporated in the National Museum, and of these more than one-third (490) were new additions, if not to science, at any rate to the Museum. The descriptive part of the volume consists of 684 pages and is illustrated with 54 plates.

The Catalogue of Birds made progress, two volumes being published :—

Catalogue of Birds. Vol. 9. By H. Gadow. Pp. 310, with 10 plates. 1884.

Catalogue of Birds. Vol. 10. By R. Bowdler Sharpe. Pp. 682, with 12 plates. 1885.

Mr. Boulenger resumed, immediately after the receipt of the Reptile collection in the Spirit Building, the preparation of the second edition of the Catalogue of Lizards, which he had commenced before the removal, and passed two volumes through the press. This work will be referred to later (1887 :—see p. 70).

Finally, the Director, Sir W. H. Flower, prepared a "List of Cetacea," pp. 36. 1885.

GROWTH OF THE COLLECTION.

(1884-85.)

The additions in these two years amounted to 168,932 specimens, mostly donations. The year 1885, in which 123,358 were received, was approached as regards number of accessions by two only of the previous years, viz., 1863, memorable for Mr. *John Bowring's* donation of his collection of Coleoptera, and 1866, in which year the Trustees purchased the *Cuming* Collection of Shells.

Of the *Challenger* collections were received: 833 Shells, 1080 Brachyurous Crustaceans, 300 Cirripedes, 216 bottles of Copepods, 486 Insects, 39 stalked Crinoids, 463 Worms, 53 Ceratose Sponges, 71 Calcareous Sponges, 874 slides of Foraminifera, 90 slides of *Orbitolites*.

The most extensive additions of these years were of Birds and Insects: the collection made by Mr. *Allan O. Hume*, C.B., comprised 63,000 Bird-skins, 19,000 eggs and nests, and 371 Mammals, all from the British Asian empire. During his many years residence in India the donor had worked at the perfecting of our knowledge of the Avifauna of British Asia in a way not approached by any of his predecessors. He organised a system under which numerous local observers

and collectors worked for and with him. He fitted out 1884-1885. — expeditions, with a staff of collectors and taxidermists, to many different parts of the empire; he acquired, besides, several important collections formed by other well-known Indian ornithologists. The value of this collection, therefore, should not be measured merely by the number of specimens which it contained, but by the judgment which determined their selection, by the history attached to many of them, and by the completeness of the several series. This was fully recognised by the Trustees. They complied with the distinctly expressed wish of the donor, that Mr. Sharpe should be sent to Simla to receive and supervise the packing of the collection. Mr. Sharpe was absent on this service four months, and the expenses connected with his journey, with the packing and freight of the eighty-two cases, amounted to £873.

5331 specimens of American Birds were received from Messrs. *Godman* and *Salvin* as the first instalment of a donation which, when completed, will perhaps not be surpassed, with regard to its intrinsic value, even by the donation mentioned above. It comprises the materials for the volumes on Birds in the donors' magnificent work, "*Biologia Centrali-Americana*." In order to render their collection available as soon as possible for general study, and more especially for the purpose of the "Catalogue of Birds," they offered to transfer to the British Museum such parts as had been completed in their work. All the specimens were most accurately labelled, so that their incorporation into the general collection entailed no more work than the mechanical labour of distributing them in their proper places in the cabinets.

Besides these collections were received 3012 Birds as the two first instalments from the *Slater* Collection and 5041 from other sources. The influx of such a large number of specimens, by which the study-series of Birds was nearly doubled, rendered a rearrangement of the whole necessary. In order to gain more room, the Half Gallery, which originally was intended for a general study, but to which students had not taken kindly, was, with the adjoining corridor, joined to the Bird Room, and fitted with cabinets. Also the staff allotted to this section had to be strengthened to assist in the rearrangement.

A collection of about 10,000 *Coleoptera* formed by the late Mr. *F. A. de Roepstorff* in the Nicobar and Andaman Islands, was presented by his widow.

A collection of 7851 Geodephagous *Coleoptera* from Central

1884-1885. America was presented by Messrs. *Godman* and *Salvin*. This donation comprised 696 species, of which more than 400 were types of new species.

A collection of 3000 Insects of various orders from the North Western Provinces of India was presented by the widow of *C. Horn*, Esq.

A set of 4687 marine Shells, proceeds of the dredging operations of H.M.S.S. *Lightning*, *Porcupine*, *Knight Errant* and *Shearwater*, was selected and put aside for the Museum by the late Dr. *J. Gwyn Jeffreys*, and delivered to the Trustees by his executors.

ADDITION TO THE STAFF.

Mr. *R. I. Pocock* was appointed as Assistant in the Zoological Department in 1885.

GRANTS FOR ANNUAL EXPENDITURE.

(1884-85.)

The grants for these two years were: for purchases, £1400 and £1500 respectively; for preparing, £1200 and £1500; for preparing and printing catalogues, £1100 and £1300; for purchase of books, £940 and £1000; for binding books, £200 in each year.

STUDENTS.

(1884-85.)

The numbers of visits paid by persons studying some part of the collection were 6883 in the first, and 8313 in the second year.

1886-87.

ARRANGEMENT OF THE COLLECTION.

The formation and arrangement of the exhibitions in the 1886-1887. several galleries had been pushed forward, so that when the British Saloon was completed on July 8th the whole of the zoological galleries were open to the public. All the study-series had been accessible to students for some time. Attention had now to be paid to the improvement of numberless details; the labels* in the Mammalian, Reptile, Shell, Starfish and Coral Galleries were revised, and many additional specimens were selected and mounted for exhibition; thus some remarkable Antarctic types were mounted for the Cetacean room, among them *Mesoplodon hectoris*, *Neobalzæna marginata*, etc., which had been acquired in 1876 by exchange from the Wellington Museum, New Zealand.

Unfortunately, this and other work was much interrupted by the protracted illness of several members of the staff.

In Mammalia Mr. Thomas commenced a thorough re-examination of the Marsupialia and Monotremata, with the view of preparing a descriptive catalogue.

In the Bird Gallery no systematic revision of the arrangement could be attempted before the plethoric condition of the Bird Room was reduced to general order and the large mass of new additions registered and incorporated. The arrangement and cataloguing of Passerine Birds were continued, and made satisfactory progress by the employment of external aid.

Mr. Boulenger completed the arrangement of Lizards and

* In the preparation of labels the old plan was generally adhered to; they gave information as to the technical and popular names, and the native country of the specimen, with the addition of the name of the donor, if it was presented. In those cases in which further information seemed to be desirable it was given as concisely as possible. The words were written in bold letters either on the stand or on a separate sycamore-tablet, and could be read without difficulty from a distance. Each case, of course, was also labelled with the name of the group to which its contents belonged. An Attendant, who had practised calligraphy, was exclusively occupied in writing the labels. The Keeper, like his predecessor, had no faith in the utility to the public of long descriptive labels, generally printed in type of ordinary size. The public find it too fatiguing, even if they had the time, to instruct themselves by reading such labels. They visit the Museum to see the objects, and those in whom an interest has been excited should find the desired instruction in a well written guide-book, either on the spot with the specimen before them or after they have reached their home. An exception was made with the labels for the groups of nesting British Birds, for which no guide was prepared.—A. G.

1886-1887. proceeded to the preparation of a new edition of the Catalogue of Tortoises and Crocodiles.

The systematic arrangement of certain portions of the Entomological collection progressed likewise, Mr. Butler working at the Moths, Mr. Kirby at *Neuroptera*, whilst Mr. Gahan had commenced with the large series of Longicorn Beetles, which occupied him for the next three years. Mr. Waterhouse incorporated many of the arrears.

The efforts made to get the specimens of *Cœlenterata* and *Porifera* determined and brought into a more forward state of arrangement, met again with disappointment. Three Assistants who were specially qualified for this task, Mr. *S. O. Ridley*, Mr. *J. J. Quelch*, and Mr. *A. Dendy*, resigned their posts, the first to take Orders in the Church, the second to take charge of the Georgetown Museum, and the third, who was appointed an Assistant in the same year, to take up a professorship at Melbourne.

THE STAFF.

(1886-87.)

Several changes had taken place in the staff of assistants, and in 1887 it included eleven members, among whom the work was distributed as follows:—

1. Mammalia : Mr. M. R. Oldfield Thomas.
- 2-3. Birds : Mr. R. Bowdler Sharpe and Mr. W. R. Ogilvie-Grant.
4. Reptiles and Fishes : Mr. G. A. Boulenger.
5. Mollusca : Mr. E. A. Smith.
6. Crustacea : Mr. F. J. Bell. Mr. E. J. Miers, who had been in charge of this class since 1872, doing most excellent work, was compelled by illness to retire from his post in 1885 ; he was succeeded by Mr. *R. I. Pocock*, who was unable to give the requisite time to this part of the collection, which was then transferred to Mr. Bell.
7. Myriopoda and Arachnida : Mr. R. I. Pocock.
- 8-10. Insecta : Mr. C. O. Waterhouse, Mr. W. F. Kirby, Mr. *C. J. Gahan*, who was appointed in 1886.
11. Echinodermata, Anthozoa and Vermes : Mr. F. J. Bell.
12. Polyzoa, Hydrozoa, Porifera, Protozoa : Mr. *R. Kirkpatrick*, appointed in 1886. The Trustees were singularly unfortunate in not retaining the services of specialists who had proved themselves well qualified for dealing with these divisions, three of the Assistants resigning their posts within these two

years, as already mentioned. These collections certainly present 1886-1887. extraordinary difficulties for systematic arrangement, and their study requires the closest application. Thus, at the time, until some specialist well acquainted with one or the other of these divisions could be found, it appeared to be better not to fill one of the vacancies created among the Assistants, but to leave the whole in charge of one Assistant, who would be responsible for the preservation of the collections.

For temporary assistance in the continuance of the Catalogue of Birds the Trustees availed themselves of the services of Mr. *P. L. Selater*, the highest authority on South American birds.

In 1887 the special grant made by the Treasury for the formation of the Natural History Library was exhausted, and as this service would henceforth involve much less work, the employment of Mr. Harting was discontinued.

GROWTH OF THE COLLECTION.

(1886-87.)

The number of additional specimens in these two years amounted to 101,547. The causes of the continuance of this high rate of annual increase will be readily understood by a perusal of the following enumeration of some of the most important acquisitions :—

Of the *Challenger* collections were received : 261 Deep-sea Fishes, 3365 Mollusca, 475 Tunicata, 956 Polyzoa, 47 Cumacea, 100 Schizopoda, 185 Holothurians, 402 Reef-Corals, 447 Sponges.

The Secretary of State for India presented a collection made by Dr. *J. E. T. Aitchison*, F.R.S., the naturalist to the Afghan Delimitation Commission, viz., 39 Mammals, 230 Birds, 124 Reptiles, 24 Batrachians, 304 Insects, etc.

The *Emin Pasha* Collection from Wadelai and Monbuttou comprised 106 Mammals, 342 Birds, 27 Reptiles, 30 Shells, and 383 Insects.

Sir *John Murray*, while directing the operations at the Marine Biological Station at Granton, transmitted from time to time a very large number of animals obtained within the littoral zone of the north-western coast of Scotland for identification. Only a selection was retained for the Museum. In these years there were added from this source the following desiderata : 385 Fishes, 619 Molluscs and Tunicates, 666 Crustaceans, 118 Polyzoa, 340 Worms, 482 Echinoderms, 83 Anthozoa, 94 Hydrozoa, 113 Sponges.

1886-1887. *Birds*.—The Department received in 1887 the *Tweeddale* Collection of Birds and ornithological works. This most valuable donation was made by Captain *G. R. Wardlaw Ramsay*, the Marquis of Tweeddale's nephew. It consisted of about 35,000 specimens, of which 27,000 were estimated to require incorporation into the collection. It excelled in certain local faunas, such as the Birds of the Philippine Islands, Andaman Islands, Malay Peninsula, etc., in which the British Museum was deficient. The library, which was transmitted by Captain Wardlaw Ramsay at the same time, consisted of about 2300 volumes, among them a number of the most costly ornithological works (by Gould, Temminck, Audubon, etc.), and was, by the donor's express desire, placed in contiguity with the study-series of birds in the Bird Room.

Beside this grand collection, further large instalments of Birds were received of the *Godman* and *Salvin*, *Seeböhm* and *Sclater* Collections; and a selection from the late Sir W. Jardine's Collection (507 specimens) was purchased.

Reptiles.—Small collections continued to be received for this branch, too numerous to be mentioned in detail, but the completion of the new edition of the Catalogue of Lizards by Mr. Boulenger permits of an authentic statement as regards the growth of this part of the collection within forty years. That time had elapsed since the Trustees published the first edition as a small 16° volume, prepared by Dr. Gray, who enumerated 471 species, represented by 1489 examples in the Museum. The later edition consists of three 8° volumes, well illustrated, enumerating 1617 species, of which 1206 are in the Museum, represented by 9803 specimens. The collection, thus, is believed to be unrivalled, like the catalogue itself, which will be the standard work for this order of Reptiles for many years to come.

Of the accessions to the collection of *Fishes*, beside those mentioned above, should be mentioned a consignment of 329 specimens from Muscat, presented by Surgeon-Major *A. S. G. Jayakar*; and the collection of Deep-sea Fishes obtained in the Faeröe Channel during the cruises of H.M.S.S. *Knight Errant* and *Triton* in 1880 and 1882. This proved to be the most important contribution that up to that time had been made to our knowledge of the bathybial fishes of the British area.

The *British Saloon* received a very valuable and instructive accession by Lord *Walsingham's* donation of his unique collection of larvæ of British Lepidoptera. They were mounted by the donor himself in life-like attitudes upon twigs or leaves,

usually of the food-plants of each species, the natural colours of the larvæ being preserved by the process adopted. The larvæ are accompanied by very complete series of specimens of the perfect insect. The collection is as valuable for classification as it is useful to the agriculturist and horticulturist, who are enabled to identify with its aid noxious species. It has been placed in two 20-drawer cabinets, in which each drawer can be pulled out by visitors, but only to within an inch of its end. By this contrivance the objects are secured from the bleaching influence of light, as well as from being handled by visitors.

Beside this series, Lord *Walsingham* presented the Trustees with a similar collection of larvæ of Indian Moths, and with his collection of North American Macrolepidoptera (1737 specimens).

6920 Longicorn Coleoptera, 487 Bruchidæ, and 1404 Hispidæ were presented by Messrs. *Godman* and *Salvin*. This represents the materials for the fifth volume of the Coleoptera of the "Biologia Centrali-Americana," and is the second instalment of the entomological collections of Messrs. Godman and Salvin, mentioned on pp. 65, 66.

CATALOGUES, GUIDES, AND DESCRIPTIVE PAPERS.

(1886-87.)

The following Guides and Catalogues were published in these two years :—

Guide to the Galleries of Mammalia. 3rd edition.

Guide to the Gould Collection of Humming Birds. New issue.

Guide to the Galleries of Reptiles and Fishes.

Guide to the Shell and Starfish Galleries.

Catalogue of Birds. Vol. 11. By P. L. Selater. Pp. 431, with 18 plates. 1886.

Catalogue of Lizards. Vol. 3. By G. A. Boulenger. Pp. 575, with 40 plates. 1887.—The first two volumes, of 436 and 497 pages, with 32 and 24 plates, had been published in 1885.

Illustrations of Typical Specimens of Lepidoptera Heterocera. Part 6. By A. G. Butler. Pp. 89. Plates 101-120. 1886. 4°.

To attain the ultimate object for which zoological specimens are collected and acquired for the British Museum, and to render them available for the progress of science, acquisitions which were known or promised to yield important results, were

1886-1887. examined with the least possible delay, the results being published in some scientific journal, if there was no early opportunity of including them in one of the official catalogues. Although well aware that this incidental work must interfere with the progress of the systematic arrangement of the general collection, Dr. Günther, like his predecessor, saw the less reason for discouraging this practice as most of the work was done in extra-official time. Besides, nothing is more discouraging and disappointing to the collector in foreign countries, who has expended energy, time, and money in his desire to advance some scientific object, than to see his collections buried or shelved. These publications being distinctly indicative of the progress of the institution from which they emanate, Dr. Günther commenced from 1881 to include a list of them in his annual "Returns" to Parliament. A repetition of these lists would be out of place here; but to show the amount of work done by the staff, beside their other curatorial duties, a short résumé of the reports and papers issued in one year (1887) is given here:—

One Report on the collections made by the officers of H.M.S. *Flying Fish* at Christmas Island, by the staff of the Department.

Four various papers on Mammalia, by Oldfield Thomas.

Five various papers on Birds, by R. Bowdler Sharpe and W. R. Ogilvie-Grant.

Eighteen various papers on Reptiles, Batrachians and Fishes, by G. A. Boulenger.

One Report on the *Challenger* Deep-sea Fishes, by A. Günther.

Six papers on Mollusca, by E. A. Smith.

Two papers on Myriopoda, by R. I. Pocock.

Five papers on Coleoptera, by C. O. Waterhouse.

Three papers on Lepidoptera, by A. G. Butler.

Two papers on Echinoderms, by F. J. Bell.

Four papers on Sponges, by A. Dendy.

One Report on the *Challenger* Monaxonida, by S. O. Ridley and A. Dendy.

DEPARTMENTAL LIBRARY.

(1886-87.)

By purchase, presentation, or exchange, this Library had grown to a total of 8492 works, or of about 12,328 volumes. All the books were properly catalogued and arranged in the room assigned to them, or in the studies of the specialists. The

contents of the Tweeddale Library (about 2300 volumes) are not included in the above statement. John Saunders, who had been trained for this duty for many years, attended henceforth to the Library under the supervision of the Keeper.

DUPLICATES.

(1886-87.)

During the removal and in the following years no time could be spared for the distribution of duplicates, with the exception of a small number, utilised chiefly for exchanges. In the present year (1887), however, 4403 specimens were presented to five provincial museums.

GRANTS FOR ANNUAL EXPENDITURE.

(1886-87.)

The grants for purchases were £1500 in the first, and £1000 in the second year; for preparing, etc., £1800, and for preparing and printing catalogues, £1400 in both years; for the purchase of books, £800 and £600; and for binding books, £160 and £120.

STUDENTS.

(1886-87.)

The number of visits of persons consulting the collections was 8372 in the first, and 8955 in the second year.

1888-89.

The great increase of the collections within the five years since they were moved into the new building, had already caused the want to be felt for more room, especially for Mammals and Birds, and still more in the Spirit and Insect Rooms. The Spirit Building, which gave about five times as much space as the vaults in the old Museum, and which, from the annual increase of the collections at the time when it was planned, was calculated to afford sufficient accommodation for fifteen or twenty years, was now quite full. Between May, 1884, and the end of 1886, 7065 bottles had been added, each of which occupies on an average a space of about 112 cubic inches. The rapidity of this increase could not have been foreseen, being due in great measure to the receipt of the large collections previously referred to, and partly to the extended requirements of modern zoological research. Of

1888-1889. necessity, part of the specimens (Mammals, Shells, Corals) had to be removed into the main building, a measure much to be deprecated on account of the risk from fire. Dr. Günther, strongly supported by Captain (Sir Eyre) Shaw, urged the enlargement of the Spirit Building, but without immediate success.

In order to provide additional accommodation for the Insect Room, a large adjoining room, hitherto used for stores, was fitted up and connected with the other entomological rooms; but whilst relief could thus be given with regard to the extension of the collection, the disproportion between the amount of work to be done and the numerical strength of the staff was becoming greater with every year. Since the year 1876 the Keeper had made eight appeals to the Trustees, describing the state of these collections and asking for adequate help by the appointment of additional Assistants qualified for the work. The Treasury was disinclined to increase the permanent staff; and when they allowed, in 1884, the addition of one Second-class Assistant, they expressed it as their opinion that five entomologists on a staff of fifteen officers would seem to be an unduly high proportion,* suggesting to check an increase of the acquisitions, which would only lead to an increased expenditure by the Department. This of course could not be done without paralyzing the progress of the Department for years to come, or without the risk of losing the position as "the richest and most important zoological collection in the world." It should be remembered that a large proportion (in some years as much as two-thirds or three-fourths) of the acquisitions was due to valuable donations, which consisted of collections formed by specialists, and which, therefore, were not merely of very great money value, but of the highest intrinsic importance, as they included the materials for a portion of zoological literature, and formed the basis of much of the progress of systematic zoology. Collections of this kind, even when offered for purchase, could not be refused, particularly not at the low prices asked for them. Further, as by far the greater number of those large acquisitions enriched only certain groups which are most popular with private collectors, viz., Birds, Shells, Beetles, Butterflies and Moths, there might have been some danger that the less favoured groups would not have that chance of development which should obtain for every branch of the National Collection of Zoology. Therefore special care had

* Some years later (in 1895) the proportion was 16 : 8, and in 1896 17 : 9.

to be taken not to miss an opportunity of acquiring desiderata 1888-1889.
for them. On the other hand, offers of many collections, large
and small, either for purchase or as gifts, were declined almost
daily, if they had no special value for the Museum.

ADDITIONS TO THE STAFF.

(1888-89.)

In 1889 two vacancies in the Staff of Second-Class Assistants, one in the Zoological Department and one in the Director's Office, were filled by the Trustees; they appointed Mr. *F. A. Heron* and Mr. *E. E. Austen* for duty in the Zoological Department. The Keeper assigned to both of them work on the Entomological collections.

GROWTH OF THE COLLECTION.

(1888-89.)

The number of additional specimens in these two years amounted to 113,357.

Of the *Challenger* collections were received: 137 Pelagic Fishes, 545 Tunicates, 400 Pteropods, 32 Polyplacophora, 109 Cephalopods, 363 Deep Sea Mollusca, 238 Shells, 26 Polyzoa, 2315 Crustaceans, 2250 Amphipods and Isopods, 66 Vermes, 137 Comatulidæ, 357 Sponges, 335 Anthozoa, 121 Hydrozoa.

A collection of marine animals made by Mr. *P. W. Bassett-Smith*, R.N., during the survey of the Tizard and Macclesfield banks, China Sea, by H.M.S. *Rambler*, was presented by the Lords of the Admiralty.

A collection of marine animals, dredged in deep water off the S.W. coast of Ireland by the Rev. *W. S. Green*, was purchased (£65).

Zoological proceeds of Mr. *H. C. V. Hunter's* expedition to the Kilimandjaro district, and of Mr. *St. George Littledale's* expedition to the Pamir and Altai Mountains (chiefly Mammalia), were presented by those gentlemen.

104 skulls of ancient Egyptians, taken from Mummy Tombs, and obtained by the *Egyptian Exploration Committee*.

Birds.—Mr. *F. D. Godman*, being aware of the deficiencies in the Museum series of North American Birds, purchased a collection of 11,000 specimens made by Messrs. *H. W. Henshaw* and *C. Hart Merriam*, and presented it to the Trustees.

A selection of 148 specimens from the renowned *Riocour* Collection, many being types described by *L. P. Vieillot*, and among

1888-1889. them a good example of the extinct *Fregilupus*, was purchased for £200, the *Fregilupus* being estimated to be worth £60.

Further large instalments of Birds were received from the *Godman* and *Salvin*, *Sclater*, and *Shelley* Collections.

The late Deputy Surgeon-General *Francis Day* bequeathed his collection of Fishes and Crustaceans to the Trustees; it was principally composed of Indian species, but included also 155 British *Salmonidæ*.

A collection of 2558 marine Shells from St. Helena, presented by Captain *W. H. Turton*, R.E. This collection formed the subject of a paper by Mr. E. A. Smith.

A named collection of 2111 Land and Fresh-water Shells from India, containing many types, was purchased.

Insects.—A collection of 5635 named Hemiptera from Central Europe was purchased (£56).

Mr. *W. Clifton* presented his entomological collection, comprising 3143 Coleoptera, 6246 Diptera, 1407 Hymenoptera, etc.

The late Mr. *W. Buckler's* collection of Lepidoptera (6000 named specimens) was presented by R. Newbury, Esq.

Mr. (afterwards Sir) *G. F. Hampson's* collection of Nilgiri Lepidoptera, consisting of 2418 named specimens and about 300 types of new species, was purchased for £118.

A collection of 2400 named Moths from New South Wales was purchased from Dr. *G. H. Raynor* for £30.

ARRANGEMENT OF THE COLLECTION.

(1888-89.)

The arrangement of the collection of Marsupialia and Monotremata was completed, and has resulted in the production of a catalogue which will remain the standard work for a study of these orders for many years to come. The care which Mr. Thomas bestowed on every part of this work by including a complete account of the osteological series of these animals and by comparing the materials in foreign museums, must account for the length of time (three years) which was devoted to its preparation.

With regard to other branches, the arrangement and cataloguing of the Birds, Reptiles, Chilopods, Phasmidæ, Blattidæ, Bostrichidæ and Lamiidæ, and of the Crinoids, made good progress. In the Coral Gallery the systematic arrangement of the specimens and models of Protozoa was completed and illustrated with diagrams.

GUIDES AND CATALOGUES.

(1888-89.)

The demand for the Zoological Catalogues had been increasing 1888-1889. for some years past, so that a greater number of copies had to be printed (600) than in former years (250-500). Free copies were sent to numerous institutions at home and in the Colonies, to foreign societies in exchange for their publications, to benefactors of the Museum, and to persons who had given material help in the preparation of the work. The remainder were sold at cost price, the stock being generally exhausted after a few years.

Besides new issues of several of the Guides the following Catalogues were published:—

Catalogue of the Marsupialia and Monotremata. By Oldfield Thomas. Pp. 401, with 28 plates. 1888. 8°.

Catalogue of Birds. Vol. 12. By R. Bowdler Sharpe. Pp. 871, with 16 plates. 1888. 8°.

Catalogue of Birds. Vol. 14. By P. L. Sclater. Pp. 494, with 26 plates. 1888. 8°.

Catalogue of the Chelonians, Rhynchocephalians and Crocodiles. By G. A. Boulenger. Pp. 311, with 6 plates. 1889. 8°.

Illustrations of Typical Specimens of Lepidoptera Heterocera. Part 7. By A. G. Butler. Pp. 124. Plates 121-138. 1889. 4°.

DUPLICATES.

(1888-89.)

In accordance with Mr. Hume's wish, 893 duplicate Birds from his collection were sent to the Museum of Comparative Zoölogy at Harvard College, and 995 Birds and 30 Crustaceans to the Museum at Edinburgh.

GRANTS FOR ANNUAL EXPENDITURE.

(1888-89.)

The grants for purchases were £1200, and for preparing £1800 in both years; for preparing and printing catalogues, £1550 in the former and £1800 in the latter year; for the purchase of books, £150 and £170; and for binding books, £20 and £30.

STUDENTS.

(1888-89.)

1888-1889. The number of visits of persons consulting the collections was 8797 in the former, and 8360 in the latter year.

1890.

ARRANGEMENT OF THE COLLECTION.

The Treasury being less reluctant to the temporary employment of specialists for certain definite work than to additions to the permanent staff of the Department, sanctioned the assistance of several ornithologists — Messrs. *Seebohm*, *P. L. Sclater*, *O. Salvin*, *E. Hargitt* and *Count Salvadori*—for the more rapid progress of the Catalogue of Birds, and, besides, granted provision for employment of the extra-official time of Mr. *Sharpe* on the same work. The Trustees also availed themselves of the long-sought-for opportunity of engaging a very efficient entomologist, Mr. (afterwards Sir) *G. F. Hampson*; he prepared the eighth part of the Illustrations of Lepidoptera Heterocera, in which he described the species discovered by him in the Nilgiris, and acquired by the Trustees. Another entomologist, Mr. *W. Warren*, was engaged in the systematic arrangement of the *Pyralidæ* and *Geometridæ*. Finally, to this list of auxiliary workers was added Mr. *George Brook*, who undertook to catalogue the Mad-reporarian Corals: a task so often commenced and interrupted by changes in the staff through death or resignation.

CATALOGUES.

(1890.)

Catalogue of Birds. Vol. 13. By R. Bowdler Sharpe. Pp. 701, with 15 plates.

Catalogue of Birds. Vol. 15. By P. L. Sclater. Pp. 371, with 20 plates.

Catalogue of Birds. Vol. 18. By E. Hargitt. Pp. 597, with 15 plates.

GROWTH OF THE COLLECTION.

(1890.)

With the sanction of the Lords Commissioners of H.M. Treasury the duplicates of the *Challenger* collections, which

hitherto had been stored at the *Challenger* Office in Edinburgh in charge of Sir John Murray, were transferred to the British Museum. They amounted to many thousands of specimens of every form of marine animals, and included numerous examples of great value. This transference was made with the understanding that, after a selection had been made of any specimens required for the national collection, "all the other specimens are to be used in the way of exchange for Deep-Sea and Pelagic specimens not represented in the British Museum, so that these Deep Sea and Pelagic collections may be rendered as complete as possible." The collection was placed in a room of the Eastern Basement, where the specimens were sorted, and detailed working lists for all the groups were prepared. None of these duplicates are included in the following statement.

The registered accessions numbered 77,658 specimens. Although this increase is considerably in excess of the average, it did not much differ in its composition from the more normal increases of other years. Almost exactly one-half were donations. With the exception of some 3000 specimens, all those purchased (38,000) had been authentically named. 45,000 specimens were Insects, of which about 37,000 were named when they reached the Museum, while only 21,000 had been named out of the 33,000 belonging to the other groups.

Of the named *Challenger* collections were received: 18 Mammals, 19 Reptiles, 184 Fishes, 416 Molluscs, 20 Polyzoa, 83 Pelagic Hemiptera, 141 Worms, 1209 Echinoderms, 18 Anthozoa, 24 Hydrozoa, 15 Sponges and 216 Radiolaria.

The *Bird* collection received further instalments from Messrs. *Godman* and *Salvin*, *Sclater*, *Seebohm* and *Shelley*, and a valuable set of South African Birds collected by the late Mr. *J. H. Gurney*, and presented by his son.

The most important acquisition of the year was the collection of *Arachnida* formed by the late Count *Keyserling*, which was one of the five large collections of Spiders known to exist at the time in private or public museums. It comprised more than 2000 species, or about 10,000 specimens. Its great value consisted in the large proportion of types (884) described by the collector and in the authentic determinations of the remainder. This collection, combined with the one previously formed by the Trustees, probably forms now the most important of this class of animals in existence. It was purchased for £450.

The collection of *Lepidoptera* formed by the late Professor *H. Frey* of Zurich, consisted of 16,000 named specimens in beautiful

1890.

condition, and chiefly pertaining to the Alpine fauna of Europe. The Microlepidoptera alone, which were but poorly represented in the Museum, amounted to 9000 examples. This collection supplemented the Zeller Collection acquired in 1883-4, and was purchased for £370, exclusive of expenses of transfer to the Museum, which amounted to £35.

Of *Coleoptera* further instalments of Messrs. *Godman* and *Salvin's* collection of Central American species, and the last instalment of the *Baly* Collection were received, aggregating 18,946 named specimens, among them 1268 types.

1760 Diptera and Neuroptera, collected by Major *J. W. Yerbury* in Devonshire, were presented by him to assist in the formation of a British collection of these orders for exhibition in the British room.

1300 Lepidoptera and Coleoptera from Bogotá, presented by Sr. *José M. Vargas Vergara*.

161 Fresh-water Sponges, named, with 188 microscopical preparations, presented by Mr. *H. J. Carter*, F.R.S.; this collection contained all the known species.

In order to convey an idea of the large size to which many Corals attain, the Keeper made many efforts to obtain specimens of a much larger size than had been exhibited hitherto. One of the first to be secured was an immense example of the Black Coral of the Mediterranean, obtained off Negropont in twenty-five fathoms of water. Its cost with carriage amounted to £73 12s.

DUPLICATES.

(1890.)

No duplicates were distributed among Museums, but some Mammals and Insects and 1000 Birds were utilised in exchanges. From the *Challenger* duplicates 100 Fishes, 240 Molluscs, 250 Crustaceans, 46 Echinoderms, and 24 Annelids were sent in exchange for similar sets to the Indian Museum, Calcutta, the Paris Museum, and the United States National Museum.

GRANTS FOR THE YEAR.

(1890.)

The grant for purchases amounted to £1500; for preparing and preserving specimens, £1800; for preparing and printing catalogues, £1650; for the purchase of books, £250; and for binding, £50.

STUDENTS.

(1890.)

The number of students consulting the collection reached a **1891-1892.** higher figure than in any previous year, their visits being — recorded as 9034.

1891-92.

The Trustees made a direct appeal to the Treasury, representing the urgent necessity for enlarging the Spirit Building, which was successful. The work was taken in hand without further delay.

Help had hardly been secured in one direction when difficulties arose in another, showing that the original demands of Professor Owen and Dr. Gray, which by many persons were pronounced to be extravagant, were, in fact, no more than the Zoological Department required, and that, as far as the main building was concerned, sufficient allowance had not been made for its immediate requirements, much less for its expansion. At Bloomsbury the Cetaceans had been stowed away in holes and corners, and the largest specimen was kept in reserve at the former owner's place, until room could be found for it in the new Museum. Soon after the large ill-lit space in the basement had been fitted up for the temporary reception of these specimens, it was completely filled, although the collection was very far from being completely representative. In 1891 the rare opportunity occurred of acquiring three large skeletons of Whales, while negotiations were in progress for the acquisition of a fourth, viz., that of the Greenland Right Whale. The Keeper, therefore, proposed to the Trustees to apply to the Treasury for sanction to erect at the back of the Museum an iron shed of a similar construction to those in use at the Science and Art Museum, the dimensions being 86 ft. long, 20 ft. broad, 12 ft. high (not counting the roof), which would serve as a supplementary exhibition room. The Trustees, in their application to the Treasury, modified the Keeper's proposal at the Director's suggestion, by asking for a shed of more than double the size, viz., of 100 ft. by 45 ft. The application was declined by the Treasury.

ARRANGEMENT OF THE COLLECTION.

(1891-92.)

1891-1892. Special arrangements had to be made for the collection of *Birds' Eggs*. In the old Museum this collection was quite insignificant, and deficient even as an exhibition of the British species. The first important addition was received in the Gould collection, purchased in 1881; other miscellaneous series followed; and finally, the magnificent donations of European and Asiatic species, by Messrs. *Godman* and *Salvin*, *Seebohm* and *Howard Saunders*, and of Indian eggs, by Mr. *A. O. Hume*, added so much to the number of specimens and imparted such a great value to this collection that its systematic arrangement could be no longer delayed. At the same time, the formation of a perfect series of British Birds' eggs for exhibition, which could be consulted by the public, had become very urgent. A series of cabinets, therefore, were provided; and, for the better conservation of the eggs, the same method which was in use for shells, viz., the placing of each clutch or set on wool in glass-topped boxes, was adopted. A requisite grant of money having been made by the Treasury, Mr. *Seebohm* undertook the work of arranging both the general and the British series; and in the course of these two years he arranged and catalogued about 24,000 specimens, belonging to fifteen families; they occupied thirteen thirty-drawer cabinets. Two large cabinets were set aside for the exhibition of the British series, the drawers being constructed, for the use of visitors, in the same manner as in the cabinets for the exhibition of Lepidopterous Larvæ.

Some of the volumes of the Catalogue of *Fishes* were out of print. Since the publication of the first volume thirty-three years had elapsed, and the contributions made during this long interval to our knowledge of the class, as well as to the collection in the Museum, had been so numerous and important as to demand a thorough revision of the whole. Therefore, the Assistant in charge of this part of the collection commenced the MS. of a new edition of this catalogue, and made some progress with the rearrangement of the Perch family.

In every branch of the Department some part of the collection was at this time in progress of systematic rearrangement; of many of these collections MS. lists were prepared, and of some descriptive catalogues. The Ophidians, Myriopods, British Echinoderms, and Polyzoa were nearly completed, and good progress had been made with the Land-shells and Madreporarians.

The entomologists continued the arrangement of *Galerucidæ*, 1891-1892. and the incorporation of the numerous recent accessions to the *Longicornia*. In the Moths the rearrangement of the Noctuidæ was continued, and that of several of the smaller families completed. In *Diptera* the Syrphidæ were under rearrangement.

During the progress of rearrangement of some entomological collections which had been previously catalogued, specimens are frequently removed from their former positions in the cabinets, sometimes to different families, and with changed nomenclature. As this must give rise to difficulties for the student who wishes to examine historically important specimens, the plan was introduced of distinguishing such specimens by additional special labels; and, besides, the Keeper ordered a list to be prepared, especially of the Walker types,* showing the new position which they occupy in the collection.

The *Parker Collection of Foraminifera* was in progress of thorough examination, in order to ascertain and preserve the history of each of the slides, the Treasury having sanctioned the employment for this important work of Prof. T. Rupert Jones, who, in conjunction with the late Prof. W. K. Parker, had made this collection his special study. 935 slides were cleaned and labelled.

CATALOGUES.

(1891-92.)

The following Catalogues were published :—

Catalogue of Birds. Vol. 16. By O. Salvin and E. Hartert. Pp. 703, with 14 plates. 1892.

Catalogue of Birds. Vol. 17. By R. Bowdler Sharpe and W. R. Ogilvie-Grant. Pp. 522, with 17 plates. 1892.

Catalogue of Birds. Vol. 19. By P. L. Selater and G. E. Shelley. Pp. 484, with 13 plates. 1891.

Catalogue of Birds. Vol. 20. By T. Salvadori. Pp. 658, with 18 plates. 1891.

Illustrations of Typical Specimens of Lepidoptera Heterocera. Part 8. The Lepidoptera Heterocera of the Nilgiri District. By G. F. Hampson. Pp. 144. Plates 139-156. 1891. 4°.

* Walker was rather careless in distinguishing the types of his new species, nor have subsequent workers exercised sufficient caution in shifting them from their original position, so that about 720 out of the 6000 Walkerian species of Lepidoptera Heterocera, which Mr. W. F. Kirby at that time calculated to be in the Museum, have still to be identified. Further displacements must be expected whilst rearrangement by different workers is in progress.

1891-1892. Catalogue of British Hymenoptera. Andrenidæ and Apidæ. By the late F. Smith. Pp. 236, with 11 plates. 1891. 8°. This is a reprint of the second edition published in 1876.

Catalogue of the British Echinoderms. By F. J. Bell. Pp. 202, with 16 plates. 1892. 8°.

A commencement was also made with issuing printed *Instructions for Collecting* for the use of travellers and collectors who are desirous of benefiting the national Museum. The need appeared to be greatest for those persons who wished to collect reptiles and fishes, and consequently the first issue was limited to those two classes. It was followed by instructions for collecting Mammalia, preserving Medusæ, and collecting deep sea animals attached to cables.

GROWTH OF THE COLLECTION.

(1891-92.)

In these two years 124,782 specimens were added to the collection: 96,375 were donations, 26,704 were acquired by purchase, and 1603 by exchange. More than one-half, 70,648, were Insects.

The accessions to the collection of Mammalia were of unusual value and importance.

First deserves to be mentioned the magnificent collection of heads and horns of the big game of India and Central Asia, formed and presented by Mr. A. O. Hume, C.B. It consisted of 223 heads, referable to about 36 species, besides a number of duplicates. Many of them are of extraordinary development, and some unrivalled in this respect. Before its distribution in the Mammalian and Osteological Galleries the collection was exhibited for some time as a whole in one of the corridors, and much appreciated by the public.

A set of 180 skins and 67 other specimens of Indian Mammals, being part of the materials used by the donor in preparing his work on the Mammals of India; presented by Dr. W. T. Blanford, F.R.S.

Mr. St. G. Littledale made another contribution of quite exceptional value to the collection of Mammals. He had undertaken an expedition to the Caucasus with the distinct object of obtaining specimens of the large game, and particularly of the European Bison, which is nearly extinct, but was known to occur there in a perfectly wild state. He was eminently successful,

and on his return presented the Museum not only with a pair of 1891-1892. Bison, but also with specimens of the Ibex, Chamois, Stag, etc.

Dr. J. Anderson, F.R.S., presented a complete series of Mammals collected during his exploration of the Fauna of Egypt (130 specimens).

Three perfect skeletons of adult and in every respect remarkable Cetaceans were purchased, viz., of the Right Whale of the North Atlantic (*Balæna biscayensis*), the species hunted and nearly exterminated by the Basques between the twelfth and sixteenth centuries) for £160; of the North Pacific Grey Whale (*Rhachianectes glaucus*), of which no specimen had previously reached Europe, for £80; and of Sibbald's Fin-Whale (*Balænoptera sibbaldi*), eighty feet long, with the baleen, for £178 10s.

The zoological specimens collected and presented by the late Sir G. Baden-Powell. They were obtained by him on the occasion of his visit to Bering's Sea, and include a set of skins and skeletons of the Fur Seal of the Prybilow Islands.

Further accessions of *Birds* from the collections of Messrs. Godman and Salvin, Seebohm, and Howard Saunders numbered 18,045 specimens; 1042 Chilian birds were presented by Mr. H. B. James shortly before his death.

The ninth and tenth instalments of Central American *Coleoptera* (18,935 specimens) were presented by Messrs. Godman and Salvin.

The Rev. H. S. Gorham's Collection of *Endomychidæ*, consisting of 790 specimens, inclusive of 91 types, was purchased for £40.

Part of Mr. F. Moore's collection of Indian Lepidoptera, belonging to the groups of *Limnaina* and *Euploeina*, and consisting of 926 specimens, inclusive of 90 types, was purchased for £50.

1498 Lepidoptera from N.W. India, selected from Major H. C. Harford's collection, were presented by him.

Mr. E. E. Green presented a selection of his collection of Moths formed at Pundaloya, Ceylon; it comprised 733 specimens, all of which were desiderata to the Museum, and 225 represented species hitherto undescribed. He accompanied this donation with MS. notes on, and beautifully executed drawings of, the metamorphoses of these insects, with the condition that a comprehensive account should be given in Pt. 9 of the Illustrations of Lepidoptera Heterocera. Mr. (afterwards Sir George) Hampson undertook this work gratuitously.

4500 Coleoptera and 8000 Rhynchota selected from the

1891-1892. collection of Indian Insects formed by the late Mr. *E.T. Atkinson*, containing numerous types ; purchased for £100.

2460 Lepidoptera from India and Burma ; presented by Lieut. *E. Y. Watson*.

958 enclosures of Insects, etc., in *amber*. This series is the second-best set of the celebrated collection brought together by Messrs. Stantien and Becker, who had the monopoly of working the amber quarries in Eastern Prussia. The first set is reserved for the Zoological Museum at Königsberg, and will remain the standard collection for all work on this fauna. Many of the specimens are mounted in amber fluid for their better preservation ; purchased for £170.

A collection of Corals made by Mr. *W. Saville-Kent* on the Great Barrier Reef of Australia ; purchased for £34.

The collection of recent Foraminifera formed by the late Prof. *W. K. Parker*, F.R.S., consisting of about 1700 slides and containing the types and other historically important specimens ; purchased for £50.

DUPLICATES.

(1891-92.)

3169 specimens were distributed among four provincial Museums, and 740 were utilised for exchanges.

GRANTS FOR ANNUAL EXPENDITURE.

(1891-92.)

The grants for purchases remained stationary, viz., £1500 ; for preparing specimens, etc., £1800 in the former and £1550 in the latter year ; for preparing and printing catalogues, £1950 and £2270 ; for the purchase of books, £200 and £230 ; and for binding books, £30 in each year.

STUDENTS.

(1891-92.)

The numbers of visits of students consulting the collections were recorded as 9443 in the former and 10,932 in the latter year.

1893.

The year 1893 proved to be not the least remarkable in the history of the progress of the Department. The erection of the new part of the building which contains the collections of specimens preserved in spirit was commenced in 1891, and the building with its fittings was ready for occupation about the middle of the present year. The extension of the building was 63 feet long and increased the available area by 2961 square feet. An additional advantage was gained by this extension: the new room can be shut off by fire-proof sliding doors from the main apartment, so that in case of fire in one room there would be a chance of saving the contents of the other. Although by this addition the storage space has been increased to a total of 1156 feet of wall or upright cases 10 feet high, and to 796 feet of table-cases, it did not prove in any way in excess of the actual requirements of these collections. All the spirit-specimens temporarily stored in the main building were removed, and those accumulated in the spirit-room were extended, so as to allow of coming accessions being easily incorporated in their proper systematic places.

The acquisition of two celebrated entomological collections (one as a purchase with the help of a special grant by the Treasury, the other as a donation), combined with the accession of several other very important collections of less magnitude, swelled the total number of specimens added during 1893 to 130,185, a higher number than had ever been reached before within the period of a single year.

Unfortunately the Department sustained a severe loss by the premature death, from heat-apoplexy, of Mr. *George Brook* at the early age of thirty-six years. The Trustees had engaged his services for arranging and cataloguing the collection of Corals two years previously; and no better evidence of the high qualifications of this talented man could be found than the volume of the catalogue which he prepared in that period, and which was published only a month before his death.

ARRANGEMENT OF THE COLLECTION.

(1893.)

The work of systematic rearrangement in the various groups specified in the previous year was steadily continued and made

1893.
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1893.
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good progress. The arrangement of the collection of Birds' Eggs, entrusted to Mr. Seebohm in 1891, was completed. The eggs, 46,900 in number, were named and entered in a MS. list; they fill 33 thirty-drawer cabinets.

The large increase of the collection of Arachnida (especially after the purchase of the Keyserling Collection) rendered it advisable to transfer the care of the Crustaceans from that section to the Assistant in charge of the Echinoderms and Worms. The whole of the alcoholic specimens of Crustaceans were rearranged in a general manner, and ready access to any of the genera which may be required was secured.

The arrangement of the *W. K. Parker* Collection of Foraminifera was completed.

GUIDES, CATALOGUES, AND DESCRIPTIVE PAPERS.

(1893.)

The demand for the guide-books continued to be satisfactory, so that new issues or editions of those published were frequently required; in the year 1893 a new edition of the Guide to the Mammalian Galleries as well as the following Catalogues were published:—

Catalogue of Birds. Vol. 21. By T. Salvadori. Pp. 676, with 15 plates.

Catalogue of Birds. Vol. 22. By W. R. Ogilvie-Grant. Pp. 585, with 8 plates.

Catalogue of Snakes. Vol. 1. By G. A. Boulenger. Pp. 448, with 28 plates. 8°.

Illustrations of Lepidoptera Heterocera. Part 9. By G. F. Hampson. Pp. 182, with plates 157–176.—This part was devoted to the Macrolepidoptera Heterocera of Ceylon, and was the last of the series, the entire series being estimated to contain illustrations of about 1900 types in the British Museum.

Catalogue of Madreporarian Corals. Vol. 1. The Genus *Madrepora*. By G. Brook. Pp. 212, with 35 plates. 1893. 4°.

Besides these works published by the Trustees, the incorporation of recent additions and the work of arrangement generally gave rise to the usual crop of incidental papers published in periodicals, viz.:—

Eight papers on Mammalia, by Oldfield Thomas.

Two papers on Birds, by R. Bowdler Sharpe and W. R. Ogilvie-Grant.

Two papers on Reptiles and Fishes, by A. Günther.

- Six papers on Reptiles and Fishes, by G. A. Boulenger.
Ten papers on Land and Fresh-water Shells, by E. A. Smith.
Eleven papers on Crustaceans, Myriopods and Arachnids, by R. I. Pocock.
Two papers on Coleoptera, by C. J. Gahan.
Six papers on Lepidoptera, by A. G. Butler.
Two papers on Hymenoptera, by W. F. Kirby.
One paper on Diptera, by E. E. Austen.
Three papers on Echinoderms, by F. J. Bell.

GROWTH OF THE COLLECTION.

(1893.)

As mentioned above, the accessions of this year amounted to 130,185 specimens, due chiefly to the two following acquisitions:

1. By the will of the late Mr. *Francis P. Pascoe* his collection of *Coleoptera*, numbering some 49,000 specimens, was in the first place offered to the Trustees for purchase. It was particularly rich in species of the families of Longicorns and Curculionidæ, to the study of which Mr. Pascoe devoted himself for more than forty years, and to the knowledge of which special interest is attached from an economic point of view, as the larvæ of many of these beetles are wood-borers doing an immense amount of injury to young trees and valuable timber. As the collection contained about 3200 types, it was expected to be of great importance in the progress of the work of the coleopterists of the Department. Its price, including the cabinets, was £2500, towards which Parliament voted a special grant of £2000.

2. With regard to its scientific and historical value, this collection is rivalled by one of *Lepidoptera*, formed by the late Mr. *Henry Tibbets Stainton*, F.R.S. Mr. Stainton was one of the most eminent entomologists of his time. He not only advanced entomology as a popular pursuit, but by his researches into the life-histories of Microlepidoptera, laid the foundation of their study in this country. His entire collection consisted of 33,569 specimens, among them the materials on which his works are mainly based. Therefore they were not incorporated in the general collection, but preserved by themselves in their original arrangement as the "Stainton Collection." This collection was presented to the Trustees by Mr. Stainton's widow, who was his constant companion in all his work and travels, and who has supplemented her donation by the additional gift of her husband's

1893.

entomological correspondence, and of a valuable series of beautifully executed drawings of the larvæ of Microlepidoptera, many of which are still unpublished.

Of other important accessions are to be mentioned the following :—

For several years past the Lords of the Admiralty presented to the Trustees numerous consignments of zoological objects, collected during the cruises, principally in the Chinese and Australian seas, of H.M.S. *Penguin*, under the command of Capt. W. U. Moore, and of H.M.S. *Egeria*, under the command of Commander A. M. Field. These collections comprised animals of all classes, and were made by Messrs. *J. J. Walker*, Chief Engineer, and *P. W. Bassett-Smith*, Surgeon; the latter paying attention chiefly to the marine fauna, the former to terrestrial animals, the Insects alone numbering about 12,200 specimens of various orders.

In continuation of former contributions, Sir *H. H. Johnston* presented in this and preceding years a series of specimens from the Nyassa Highlands, which were examined and reported upon by the staff of the Department. They included 19 Human crania, 193 Mammals, 598 Birds, 133 Reptiles and Batrachians, 103 Fishes, 128 Shells, 200 Coleoptera and 562 Lepidoptera.

The collection made by Dr. *J. W. Gregory* during his expedition to Mount Kenia consisted of 46 Mammals, 89 Reptiles and Batrachians, 50 Fishes, 119 Shells, 39 Arachnids, 43 Myriopods and 1089 Insects of all orders.

Messrs. *Godman* and *Salvin* delivered the last instalment of their collection of Central American Birds in the present year. The total number of specimens of this magnificent donation, delivered in several successive years, exceeds 20,000. No other collection ever received by the Trustees had been more carefully named or labelled.

A valuable set of remains of extinct New Zealand Birds, discovered by Mr. *H. O. Forbes* at Oamaru (South Island), comprising *Dinornis*, *Cnemidornis*, *Harpagornis*, etc., was acquired by exchange.

Further instalments of Central American Coleoptera and Hemiptera were received as a donation from Messrs. *Godman* and *Salvin*.

2040 Land and Fresh-water Shells, including 680 types, were selected from the collection of the late M. *Arthur Morelet*, of Dijon, and purchased for £200.

DUPLICATES.

(1893.)

The time of the staff was too much occupied to allow of a 1894-1895. distribution of Duplicates, but 6 Mammals, 753 Birds, 7 Frogs — and 232 Shells were utilised in making exchanges.

GRANTS FOR THE YEAR.

(1893.)

The grants were :—for purchases, £3500 (inclusive of £2000 for the Pascoe collection); for preparing specimens, £1800; for preparing and printing catalogues, £1675; for the purchase of books, £240; for binding, £30.

STUDENTS.

(1893.)

The number of visits of persons consulting the collections was 10,872.

1894-95.

!ARRANGEMENT OF THE COLLECTION.

Owing to the moderate number of accessions in these two years, the work of systematic rearrangement, as well as the incorporation of some of the unarranged material, made satisfactory progress :—

1. The accessions to the collection of *Mammalia* were never so excessive (before 1894 they had reached 1000 only exceptionally) that the Assistant in charge (Mr. O. Thomas) could not cope with their incorporation, or that the arrangement of the specimens was seriously disturbed. In 1894 the Keeper again urged the Trustees to apply to the Treasury for the erection of a supplementary building for Cetaceans. The application was granted, and the work commenced in 1895.

2. *Birds* (Messrs. R. Bowdler Sharpe and W. R. Ogilvie-Grant).—The arrangement of the study collection proceeded with the progress of the catalogue, but some of the previously arranged portions had to be expanded. The collection of skeletons and

1894-1895. bones was transferred to two rooms in the basement, every specimen being readily accessible for study. Mr. Ogilvie-Grant was absent for some time from work in the Museum, having received special leave of absence to enable him to visit the Salvages with the object of making a collection of specimens of their fauna.

3 and 4. The collections of *Reptiles*, *Batrachians* and *Fishes* (Mr. Boulenger) and of *Mollusca* (Mr. E. A. Smith) were in perfectly orderly arrangement. The preparation of a volume of Percoid fishes necessitated a rearrangement of the specimens of this group.

5. Mr. Bell continued the work on the collection of Crustaceans, and completed the list of Maioid and Cancroid Crabs.

6. *Myriopoda* and *Arachnida* (Mr. R. I. Pocock).—The Myriopods and Scorpions were in so forward a state of arrangement that any incoming accessions could be dealt with without difficulty, MS. lists of the species and specimens in the collection being completed. The very large collection of Spiders was still in a very partial condition of arrangement. Mr. Pocock, however, had commenced preparing similar lists of a few of the families, as the *Aviculariidae*, besides preparing faunistic reports on some collections which reached the Museum about this time. But the principal event was the donation of a large named collection formed by Mr. E. W. Oates during a three years' residence in Burma. Anxious to see this collection examined and described, Mr. Oates had sent it for that purpose five years before to Dr. Thorell, the well-known arachnologist, and offered it with Prof. Thorell's MS. (which in fact was a complete descriptive catalogue) to the Trustees. When received, it was found to consist of 1550 specimens (exclusive of Myriopoda) referable to 310 species, of which 153 were new. The Trustees sanctioned the publication of the MS. under the title of "A Catalogue of Burmese Spiders in the British Museum."

7. The systematic arrangement of the general collection of *Coleoptera* (Messrs. C. O. Waterhouse and C. J. Gahan) was limited to the families *Galerucidae* and *Eumolpidae*, while a large amount of unidentified material, or miscellaneous smaller sets, as, for instance, the contents of small boxes from the Pascoe Collection, were worked out or incorporated in their systematic places in the general series.

8. Three specialists were at work on *Lepidoptera*. Mr. Heron steadily devoted himself to the collection of Butterflies, at times assisted by Mr. Butler and Lieut. E. Y. Watson. The incorpora-

tion of the Godman-Salvin Collection required expansion of the 1894-1895. Morphinae, Euploeinae and other Nymphalid groups, all of which had to be rearranged. Dr. Butler and Mr. G. F. Hampson devoted themselves almost exclusively to the Moths. The former completed the arrangement of the *Noctuidæ*, a work which has been only shortly referred to in the preceding pages, although it was actually commenced in 1889. It well illustrates the growth of the collections generally, and the amount of labour entailed by this growth. When the late Mr. F. Walker completed his catalogue of Moths in the Museum in the year 1866, the *Noctuidæ* occupied five twenty-drawer cabinets, and were represented by about 7150 specimens. After all the acquisitions of the last thirty years had been incorporated and arranged in systematic order, they occupied twenty-seven cabinets of the same size, and were estimated to be represented by 8930 species and 41,760 specimens. The faunæ of the Indian Empire and of Europe were, perhaps, the most completely represented in the collection. Mr. Hampson, who had been engaged as an auxiliary entomologist during the last two years, made very satisfactory progress with the rearrangement of several other families (part of the *Pyrælidæ*, *Sesiidæ*, etc.). The Treasury sanctioned in 1895 his appointment on the permanent staff under Clause 7 of the Order in Council, 1870.

As the Stainton Collection was kept separate in its own cabinets, a MS. list of the specimens was prepared to facilitate reference to particular species required for consultation, and to insure the integrity of the contents.

9. The rearrangement of the *Orthoptera* and *Neuroptera* was proceeded with by Mr. W. F. Kirby, the large family of *Phasmidæ* being the last on which he was engaged in 1895.

10. Mr. E. E. Austen, soon after his appointment, began the formation of a series of British *Diptera*, which made gradual progress, seven of the families being fairly represented, and the *Muscidæ* having been arranged in 1894. In the general collection he worked chiefly at the *Syrphidæ*.

In 1895 this Assistant obtained special leave from the Trustees to accompany a cable-laying expedition on the Amazon River as far as Manaos, with the view of collecting specimens. Messrs. *Siemens Bros. & Co.*, who sent out this expedition, had offered a free passage to a zoologist of the Museum.

11. Of *Rhynchota* the large family of *Cicadidæ* was revised by Mr. Kirby, who had commenced his revision some years before.

12. *Echinodermata* and *Vermes* (Mr. Bell).—The MS. list of

1894-1895. the former was regularly kept up to date, and the spirit collection of *Polychæta* was completely rearranged.

13. *Anthozoa*.—The Treasury sanctioned in 1894 the temporary employment of Mr. *H. M. Bernard* as successor to Mr. Brown for the continuation of the work on Corals.

14. *Hydrozoa* and *Spongiida*.—Mr. R. Kirkpatrick had so far examined and arranged the collections of these two divisions that the preparation of the MS. lists could be commenced. He had also arranged the microscopical preparations, amounting to about 3000 slides, in suitable boxes labelled with the generic names, the species being arranged alphabetically.

15. *Polyzoa* and *Protozoa*.—Mr. R. Kirkpatrick continued to attend to their arrangement; but no noteworthy accessions were received in these two years.

Instructive or exceptionally fine specimens were mounted for *exhibition* in nearly all the galleries. To the series of Mammals there were added a mounted skin and skeleton of the nearly extinct southern form of *Rhinoceros simus*, acquired through the enterprise of the Hon. *Walter Rothschild*; further, two skins and a skeleton of the Wild Bactrian Camel, which Mr. *St. G. Littledale* procured, with other valuable specimens, on his last expedition into Eastern Turkestan.

The rearrangement of the exhibited series of Birds was commenced with the Parrots, but only slow progress was made, as the history of every specimen which for any reason was to be removed from the gallery had to be investigated. A fine example of the extinct gigantic Land Tortoise of Madagascar and a South American Mud-fish (*Lepidosiren*) were added to the Reptile and Fish Galleries. In the Insect Gallery much progress was made: the Hymenoptera and Rhynchota, at first exhibited in table-cases, were transferred to specially made cabinets, the drawers being accessible to the public. In adding to the models illustrating the life-histories of Insects, preference was given to those to which special interest is attached on account of the injury they cause to cultivated plants. Care was taken that all the objects should be accompanied by descriptive labels, and generally by enlarged drawings of minute forms or structures. In the Coral Gallery also many additions were made to the explanatory and illustrated labels, as also to the series of large Coral masses of *Madrepora* and *Turbinaria*.

CATALOGUES.

(1894-95.)

The following Catalogues were published:—

1894-1895

Catalogue of Birds. Vol. 23. By R. Bowdler Sharpe. —
Pp. 353, with 9 plates. 1894.*

Catalogue of Birds. Vol. 27. By T. Salvadori. Pp. 636,
with 19 plates. 1895.

Catalogue of Fishes. Second edition. Vol. I. By G. A.
Boulenger. Pp. 394, with 15 plates. 1895. 8°.

Descriptive Catalogue of the Spiders of Burma. By T.
Thorell. Pp. 406. 1895. 8°.

GROWTH OF THE COLLECTION.

(1894-95.)

The number of specimens acquired in these two years was 103,557; of these 59,000 were received as donations, and 66,559 were Insects. The accessions to the Mammalia were 2212, among them some 126 types, besides many others not previously represented in the Museum. Among the chief contributors were the late Lord *Lilford*, who presented 142 specimens from various parts of Europe; Lieut.-Col. *J. W. Yerbury*, who presented 89 specimens from Aden; and Surgeon-Major *Jayakar*, who continued his previous gifts with 41 Mammalia from Muscat. In the East Messrs. *C. and E. Hose* collected in Sarawak (72 specimens), the late Mr. *A. H. Everett* at Balabac, Palawan, in North Borneo and the Natuna Islands (157 specimens), and the late Mr. *J. Whitehead* in North Borneo and Luzon (71 specimens). Of other collections may be mentioned:—

Another consignment from Nyassaland, presented by Sir *H. H. Johnston*, comprising 26 Mammals, 183 Birds, 33 Reptiles, 50 Arachnids and 744 Insects.

Mr. *G. F. Scott-Elliot* presented, besides various specimens of vertebrates and invertebrates, 700 Insects, all collected by him during his travels in Eastern Central Africa.

* After Vol. 23 the sequence of the publication of the remaining volumes had to be broken as Mr. Sharpe had not succeeded in completing the Wading Birds, on which he had been engaged since 1891, and which he had anticipated finishing in 1893. The causes of his miscalculation are explained by him in his Introduction to Vol. 24. As Messrs. Howard Saunders, O. Salvin and Ogilvie-Grant had undertaken to assist in the production of Vols. 25 and 26, the speedy completion of this monumental work of the British Museum was not expected to offer any further difficulties.

1894-1895. Mr. W. R. Ogilvie-Grant brought from his visit to the Salvages 247 skins and eggs of Birds, mostly Petrels, 143 Fishes, 137 Land and Marine Shells and 16 Echinoderms.

The remainder of Capt. G. E. Shelley's African Birds (3452 specimens) were purchased for £517 16s. 0d., and Lieut.-Col. H. H. Godwin-Austen's Collection made during his expedition into Assam and Manipur (4426 specimens) for £200.

122 Reptiles and Batrachians from Central America were presented by Mr. F. D. Godman.

175 Reptiles and Batrachians, with specimens of *Lepidosiren*, from Paraguay, were purchased of Dr. J. Bohls.

The original collection of the Land Shells of the Atlantic Islands, described by the late T. V. Wollaston in his work "Testacea Atlantica," consisting of 509 specimens, was purchased for £30.

328 Arachnida, 148 Myriopoda and 125 Odonata, also seven specimens of Peripatus, all from the West Indies, were presented by the Royal Society and the British Association.

Of the numerous acquisitions by which the Entomological section was enriched, only a few can be referred to here. The most important by far was the collection of Indian Moths formed by Mr. F. Moore; it consisted of 21,570 specimens, referable to 5406 species and including 1856 types. It was purchased for £500.

Mr. F. Moore's Indian Satyriinæ, 1732 in number, were purchased for £65.

Messrs. Godman and Salvin sent other instalments of their Central American collection, viz., 2837 Coleoptera, 503 Orthoptera, and 4844 Lepidoptera. The former presented, besides, his collection of 2250 Old-World Butterflies, among them 318 specimens of *Ornithoptera*.

1800 Coleoptera from the Nilgiris were presented by Mr. G. F. Hampson.

1500 Moths, part of the collection of the late Mr. W. Wilson Saunders, containing many of Walker's types, were purchased for £50.

528 named Diptera, partly British species, partly valuable as types of *Syrphidæ*, were presented by Mr. G. H. Verrall.

1809 Diptera, collected in the New Forest and South Devon, were presented by Lieut.-Col. J. W. Yerbury.

Finally a collection of 91 Corals from N.E. Australia, formed by Mr. W. Saville-Kent, and including four exceedingly fine *Turbinaria*, was purchased for £50.

CENSUS OF THE COLLECTION.

(1894-95.)

No actual census was taken of the collection, of the kind **1894-1895.**
carried out in 1868 and 1880. But as the registers of accessions
had been kept with the greatest possible care since that period,
the numerical status of the collections in the Department can be
ascertained with tolerable accuracy. The number of duplicates
distributed among other museums or used for exchanges has been
left out of the calculation, as a large proportion had been set
aside as duplicates and were never entered in the registers. At
any rate their number was not sufficiently large to vitiate the
totals given for comparison here.

The total number of specimens was found

in 1868 to be close upon 1,000,000,

in 1880 to be close upon 1,300,000,

in 1895 to be close upon 2,245,000.

The average of the annual increase during the last fifteen
years was 63,000 specimens, whilst it had been 25,000 in the
twelve preceding years.

DUPLICATES.

(1894-95.)

9633 specimens were distributed among various museums
and institutions, while several hundreds were utilised for
exchanges.

DEPARTMENTAL LIBRARY.

(1894-95.)

In 1895 the Zoological Library contained 10,036 separate
works or 16,238 volumes. All these works were duly entered in
the Departmental MS. Catalogue, and the Library itself was
kept in perfect working order.

GRANTS FOR ANNUAL EXPENDITURE.

(1894-95.)

1894-1895. In both these years the grants were :—for purchases, £1800 ;
— for preparing specimens and apparatus, £1600 ; for preparing and
printing catalogues, £2300 ; for purchase of books, £240 ; for
binding £40.

STUDENTS.

(1894-95.)

The number of visits by students consulting the collections
was 10,730 in the former and 8189 in the latter year.

INDEX.

- ABBOT, J., drawings of the Insects of Georgia transferred to the Department, 54
 Abraham, P. S., Nudibranchs arranged by, 31
 Abyssinian Expedition, collections formed during, acquired, 19
 Adams, Henry, collection of Shells purchased, 37
 Afghan Delimitation Commission (see Aitchison)
 Aitchison, Dr. J. E. T., collection made during the Afghan Delimitation Commission, 69
 Alder, Joshua, British Mollusca presented, 15
 Alert, H.M.S., collections made during the voyages of, 44, 63
 Allport, Morton, collection of Fishes from Hobart, 28
 Amber, Insects, etc., in, purchased, 86
 Anderson, Dr. J., Mammals from Egypt presented by, 85
 Angas, G. F., collection of Shells presented by, 23, 37
 Anoplura, Denny Collection acquired, 8
 Anthropological collection, 57
Antipathes, specimen exhibited, 28
 Arachnida, state of collection in 1856..7
 ——— Keyserling Collection purchased, 79
 ——— MS. lists of, 92
 Arctic Expedition (1875)..35
 Atkinson, E. T., Indian Coleoptera and Rhynchota collected by, purchased, 86
 Attendants, duties of, 51
 Austen, E. E., appointment of, 75
 ——— visit to S. America, 93
 BADEN-POWELL, Sir G., Zoological collections from Bering's Sea presented by, 85
 Baird, Dr. W., Assistant, 9
 ——— engaged upon the Mollusca, etc., 6, 9
 Baird, Dr. W., death of, 22, 23
 Bakewell, Robert, Coleoptera selected from his collection, 21
Balæna australis, skeleton acquired, 27
Balanoptera musculus, specimen purchased, 45
 Balfour, Prof. I. B., collections from Socotra presented, 44
 Baly, Dr. J. S., collection of *Phytophaga* purchased, 46, 80
 ——— Catalogue of *Hispidæ*, 10
 Banks, Sir Joseph, collections acquired, 19
 Barboza du Bocage, Prof., West African Reptiles presented by, 20
 Bassett-Smith, P. W., marine animals collected in the China Sea by, presented, 75
 ——— collection made in China, Australia, etc., presented, 90
 Bate, C. Spence, Catalogue of Amphipodous Crustacea, 10
 Bates, Frederick, collection of *Heteromera* purchased, 46
 Bates, H. W., collections of, 14, 18
 Batrachia, study-series, condition in 1856..5
 ——— Catalogues of Reptiles and, by Dr. A. Günther, 10
 ——— Catalogues of, by G. A. Boulenger, 52
 ——— growth of the collection, 53
 Bats (Chiroptera), Catalogue of, by G. E. Dobson, 25, 33
 ——— Fruit-eating, etc., Catalogue of, by Dr. J. E. Gray, 24
 Beddome, Col. R. H., Reptiles from Southern India purchased, 27
 ——— Reptiles presented by, 20, 27
 Bell, F. J., appointment of, 35
 ——— duties of, 68
 ——— Catalogue of British Echinoderms, 84
 Bell, T., Catalogue of Crustacea by, 6
 Bennett, J. W., Ceylonese Fishes acquired, 19

- Bernard, H. M., engaged to continue the Catalogue of Corals, 94
 Berthelot, *see* Webb
 Biologia Centrali-Americana, by Messrs. Godman and Salvin, 65
 Birds, exhibition in 1856..2, 3; in New Museum, 58
 — British nesting, exhibited in their natural surroundings, 30
 — study-series, condition in 1856..4
 — British, Catalogue of, by G. R. Gray, 18
 — Catalogue of, begun by R. Bowdler Sharpe, 23, 26
 — Handlist of the Genera and Species, by G. R. Gray, 24
 — Malayan, collected by A. R. Wallace, 27
 — Eggs (*see* Eggs)
 Blackman, Mrs. V. H., 31
 Blanford, W. T., collection of Vertebrata from Persia, obtained from, 29
 — Indian Mammals presented by, 84
 Bleeker, P., fishes described by, acquired, 14
 Boheman, Prof. C. H., Catalogue of Cassididae, 10
 Böhls, Dr. J., Reptiles, etc., from Paraguay purchased from, 96
Bonite, collection made during voyage of the, 6
 Boulenger, G. A., engaged to rearrange the Batrachia, 41
 — appointed a First-Class Assistant, 51
 — Catalogues of Batrachia, 52
 — Catalogue of Lizards, 64, 71
 — Catalogue of Chelonians, Rhynchocephalians and Crocodiles, 77
 — Catalogue of Snakes, 88
 — Catalogue of Fishes, 2nd Ed., 82, 95
 Bowerbank, J. S., collection of Sponges acquired, 32, 37, 42
 Bowring, J. C., collection of Coleoptera presented, 18, 64
 Bremen Geographical Society, Expedition to Western Siberia and Turkestan, collection purchased, 36
 Brencley, Julius L., collections presented by, 23, 29
 British Association, specimens from West Indies, 96
 — Fauna, exhibition in 1856, 2, 3
 — Saloon, 57, 61, 67, 70
 British Museum, Select Committee on, 1860..2
 Brook, George, Catalogue of Madreporarian Corals, 78, 87, 88
 — death of, 87
 Brown, Edwin, collection of Coleoptera acquired, 37
 Brown, G., Mammalia from Duke of York I. purchased, 36
 Brüggemann, Dr. F., employed upon the Corals, 32, 35
 Brunner von Wattenwyl, types of Orthoptera purchased, 28
 Buchecker, H., collection of Swiss Hymenoptera, selection purchased, 46
 Buckler, W., collection of Lepidoptera presented by R. Newbury, 76
 Buprestidae, Edward Saunders' collection purchased, 28
 Busk, George, collection of Polyzoa acquired, 6, 33
 — Catalogue of Marine Polyzoa, 6, 33
 Butler, A. G., appointed Assistant, 17, 34
 — appointed Assistant-Keeper, 41
 — Catalogue of Satyridæ, 18
 — Catalogue of Fabrician types of Butterflies, 18
 — Illustrations of Typical Specimens of Lepidoptera Heterocera, by, 33, 44, 71, 77
 — arrangement of the Nottuidæ by, 93
 CAMEL, Wild Bactrian, specimens obtained and exhibited, 94
 Canaries, Catalogue of Coleoptera of the, by T. Vernon Wollaston, 18
 Carpenter, Dr. P. P., Catalogue of Mazatlan Mollusca, 10
 — Mazatlan Mollusca presented, 15
 Carter, H. J., determination of the collection of Sponges by, 32
 — collection of fresh-water Sponges presented by, 80
 Cases, Exhibition-, construction of, 40
 Cassididae, Catalogue of, by Prof. C. H. Boheman, 10
 Catalogues, 11, 18, 24, 33, 43, 52, 63, 71, 77, 78, 83, 88, 95
 — General plan of, 11, 12, 25
 Census of Zoological Collection, 47, 97
 Cephalopods, lists of, 23
Ceratodus, specimens obtained from New South Wales, 28

- Cetacea, series of Antarctic forms acquired, 36
 ——— exhibition of, in Basement, 33, 58
 ——— List of, by Sir W. H. Flower, 64
 ——— Guide to the Gallery, 63
 ——— new temporary room for, 81, 90
 ——— *see also* Whale, Whales
 Chaillu, *see* Du Chaillu
 Challenger Collection, acquired, 37, 42, 44, 53, 64, 69, 75, 79
 ——— duplicate specimens, 78, 79, 80
 Chelonians, Rhynchocephalians and Crocodiles, Catalogue of, by G. A. Boulenger, 77
 Chevrolat, L. A. A., collection of Longicornia acquired, 18
 Chilopoda, Catalogue of, by G. Newport, 7, 10
 Chiroptera, Catalogue of, by G. E. Dobson, 25, 33 (*see also* Bats)
 Chitty, E., Collections of Mollusca acquired, 6, 15
 Clark, Rev. Hamlet, Catalogue of Halticidæ, 10
 ——— Coleoptera purchased from, 21
 Clifton, W., collection of Insects presented by, 76
 Cochrane, Rear-Admiral Hon. A. A., Pacific collections presented, 36
 Collecting, Instructions for, issued, 84
 Collection, condition and arrangement of, 2, 16, 22, 30, 42, 52, 55, 67, 76, 78, 82, 87, 91
 ——— growth of, 13, 18, 26, 35, 44, 52, 64, 69, 75, 78, 84, 89, 95
 Colvill, Dr. W. H., collection of Fishes from the River Tigris, 28
 Cookson, Commander W. E., collection from the Galapagos Islands, 36
 Coppinger, Staff-Surgeon R. W., collections of, during the voyage of H.M.S. *Alert*, 44
 Coral, Black, from Negropont, large specimen obtained, 80
 ——— Gallery, in New Museum, 61, 76, 94
 ——— Gallery, Guide to the, 63
 Corals, arrangement by Dr. Brügge-mann, 32 (Catalogue of, *see* Brook)
 Correspondence, arrangement of, 15
 Corrie, Surgeon A., R.N., 35
 Cowan, Rev. W. Deans, collection made in Madagascar, purchased, 53
 Crateromorpha, specimen exhibited, 28
 Crustacea, study-series, condition in 1856..6
 ——— arrangements for care of, 6, 10, 17, 23, 31, 88, 92
 ——— Catalogue of, by T. Bell, 6
 ——— Catalogue of Amphipodous, by C. Spence Bate, 10
 Cuming, Hugh, collection of Shells acquired, 16, 19
 Cunningham, Dr. R. O., collections formed by, presented, 19
 Curaçoa, H.M.S., collection made during the voyage of, 29
 Curculionidæ, list of British, by J. Walton, 11
 ——— Jekel Collection of, acquired, 18
 Curtis, John, types of Insects acquired, 19
 Cuvier, G. L. C. F. D., 56
 DALLAS, W. S., employed upon the Rhynchota, 8
 Danford, C. G., Mammalia from Asia Minor purchased, 36
 Darwin, C., series of Domestic Pigeons, presented by, 20
 Davidson, T., Challenger Collection of Brachiopods described by, 37
 Day, Deputy Surg.-General Francis, collection of Fishes and Crustacea bequeathed, 76
 Dendy, A., appointment of, 68
 ——— resignation of, 68
 Denny, Henry, Collection of Anoplura acquired, 8
 Dermaptera Saltatoria, Catalogue of, by F. Walker, 25
 Descriptive papers, 8, 9, 29, 32, 43, 72, 88, 89
 Desvignes, Th., list of British Ichneumonidæ, 11
 ——— collection of British Ichneumonidæ purchased, 21
 Diptera, arranged by F. Walker, 8
 ——— British collection started, 93
 Dobson, G. E., Catalogue of Chiroptera, 25, 30, 33
 Dodo, skeleton obtained, 20
 Dolphins, Fresh-water, acquired, 20
 ——— Fresh-water, skeleton acquired, 27
 D'Orbigny, *see* Orbigny, D'.
 Doubleday, E., employed upon the Rhopalocera, 8
 Du Chaillu, P. B., collections of, 14, 20

- Duplicates, regulations made for the distribution of, 47
 ——— distribution of, 47, 54, 73, 77, 80, 86, 91, 97
- EAST INDIA COMPANY MUSEUM transferred, 13, 44
- Eaton, Rev. A. E., collection of Marine Invertebrates from Spitsbergen presented, 29
 ——— Expedition to Kerguelen, 35
- Echinoderms, Catalogue of British, by F. J. Bell, 84
 ——— MS. list of, 93
- Edmonds, Thomas, Lepidoptera from Chili presented by, 54
- Egeria*, H.M.S., collections made during the cruise of, presented, 90
- Eggs, Birds', arrangement of the collection, 82, 88
- Egyptian Exploration Committee, skulls of ancient Egyptians presented by the, 75
- Elephant, Sumatran, acquired, 20
- Elliot, Sir Walter, skulls of Indian Dolphins presented by, 20
- Emett, Miss E. D., assistance in preparation of nesting bird groups, 31
- Emin Pasha, collection from Wade-lai and Monbuttu acquired, 69
- Entomological Society of London, collection acquired, 14
- Erebus and Terror*, H.M.S.S., collection made during voyage of, 5
- Everett, A. H., Mammals from the Philippine Islands purchased, 36
 ——— Mammals from Borneo collected by, 95
- Exhibition-series, separated from the study-series, 2, 3
- Expenditure, Annual, 1, 15, 21, 29, 38, 49, 55, 66, 73, 77, 80, 86, 91, 98
- Extension of the Museum (*see* Natural History Museum, Spirit Building, Whale Room)
- Eydoux and Souleyet Collection acquired, 6
- Eyton, T. C., Collection of Birds and skeletons purchased, 45
- FABRICIUS, J. C., types of his Butterflies catalogued by A. G. Butler, 18
 ——— types of his species acquired, 19
- Falcons, Gould Collection purchased, 27
- Feilden, Capt. H. W., Arctic Expedition (1875) . . 35
 ——— collection of Shells from Malta presented, 37
- Fisheries Exhibition, International, specimens presented by Foreign and Colonial Governments from the, 53
- Fishes, exhibition in 1856 . . 2, 3; in New Museum, 59
 ——— study-series, condition in 1856 . . 5
 ——— Catalogue of, by Dr. A. Günther, 10, 18; by G. A. Boulenger, 82, 92, 95
 ——— Deep-sea, from the Faerøe Channel obtained, 70
 ——— Guide to the Galleries of Reptiles and, 63, 71
 ——— *see also* Godeffroy
- Flower, Sir W. H., list of Cetacea, 64
- Flying Fish*, H.M.S., collections of, 72
- Foraminifera, Parker Collection of, 83, 86, 88
- Forbes, H. O., collection of specimens from Timor Laut presented, 53
 ——— extinct New Zealand Birds discovered by, acquired, 90
- Fregilupus*, extinct, specimen purchased, 76
- Frey, Prof. H., collection of Lepidoptera purchased, 79
- Fritsch, Dr. C. von, collection of Fishes from Siberia, 28
- GADOW, H., Catalogue of Birds, Vols. 8 and 9, by, 52, 64
- Gahan, C. J., appointment and duties of, 68
- Geodephaga, Tatum Collection of, acquired, 18
- Gerrard, Edward, chief Attendant, 4, 9
 ——— Osteological Catalogue, 16, 18
- Godeffroy Museum, South Sea Fishes obtained from the, 28
- Godman, F. D., collections of Insects from the Azores presented, 29, 37
 ——— collection of North American Birds presented, 75
 ——— collection of Old-World Butterflies presented, 96
 ——— Reptiles, etc., from Central America presented, 96
 ——— and Salvin, O., collections of, 14, 20
 ——— collection of Birds' eggs presented, 37, 82
 ——— collection of Old-World and Australian Birds presented, 45
 ——— Birds presented, 65, 70, 76, 79, 85, 90
 ——— collections of Central American Insects presented, 66, 71, 80, 85, 90, 96

- Godwin-Austen, Lt.-Col. H. H., collection from Assam and Manipur acquired, 96
- Goodenough, Commodore James G., collections and death of, 35
- Gorham, Rev. H. S., collection of Endomychidæ purchased, 85
- Gould, John, Collection of Falcons purchased, 27
- collection of Birds purchased, 45
- see also Humming Birds
- Grampus griseus*, specimens acquired, 27
- Grants, Annual (see Expenditure)
- Gray, G. R., Senior Assistant, 9
- Assistant Keeper, 22
- MS. list of Birds prepared by, 5
- Rhopalocera arranged by, 8
- Catalogue of the Birds of the Tropical Islands of the Pacific Ocean, 13
- List of the specimens of Birds, 18; Psittacidæ and Columbæ, 13
- List of Lepidopterous Insects (Papilionidæ), 13
- Catalogue of British Birds, 18
- Handlist of the Genera and Species of Birds, 16, 23, 24
- Gray, Dr. J. E., Keeper of the Zoological Department, 1, 9
- retirement and death of, 22
- Catalogues of Mollusca, 6
- List of British Animals, 12
- Catalogue of Lizards, 70
- List of the Specimens of Mammalia, 12
- Guide to the Systematic Distribution of Mollusca, 13
- Catalogue of Mammalia, 18
- Catalogue of the Hodgson Collection, 14, 18
- List of Olividæ, 18
- Catalogue of Amphisbæ-nians, 23
- Catalogue of Monkeys, Lemurs and Fruit-eating Bats, 24
- Catalogue of Seals and Whales, 24
- Handlist of Seals, Morses, Sea-Lions and Sea-Bears, 24
- Catalogue of Ruminant Mammalia, 24
- Handlist of the Edentate, Thick-skinned and Ruminant Mammals, 24
- Catalogue of Shield Reptiles, 24
- Gray, Dr. J. E., Handlist of the Specimens of Shield Reptiles, 23, 24
- Catalogue of Sea-pens, 25
- Catalogue of Lithophytes, 25
- Gray, J. E. and G. R., Catalogues of the Mammalia and Birds of New Guinea, 13
- Gray, Mrs., collection of Shells presented by, 23, 28
- Green, E. E., Ceylonese Moths, drawings, etc., presented by, 85
- Green, Rev. W. S., Marine Animals collected off the S.W. coast of Ireland by, purchased, 75
- Gregory, Dr. J. W., collections made in East Africa, 90
- Grote, A. R., collection of N. American Lepidoptera purchased, 46, 54
- Guide-Books, 49, 63, 71, 77, 78
- Gulliver, G., Expedition to Rodriguez, 35
- Günther, Dr. A., commencement of his work in 1857. . 10
- appointment as Senior Assistant, 17
- appointed Assistant Keeper, 22; Keeper, 30; retirement, iii
- Catalogue of Reptiles and Batrachians, 10
- Catalogue of Fishes, 10, 16, 18
- "Gigantic Land-Tortoises" by, 23, 33
- Guppy, H. B., collections from the Solomon Islands presented, 53
- Gurney, J. H., South African Birds collected by, presented, 79
- HAGEN, Dr. H., Catalogue of Neuroptera (Termitina), 11
- Halticidæ, Catalogue of, by the Rev. Hamlet Clark, 10
- Hampson, [Sir] G. F., engaged to work at Lepidoptera Heterocera, 78
- appointment of, 93
- Lepidoptera collected in the Nilgiris purchased from, 76; Catalogue of, 83
- Illustrations of Lepidoptera Heterocera, 83, 85, 88
- Coleoptera from the Nilgiris presented by, 96
- Hardwicke, Major-Gen. T., drawings of Indian animals transferred to the Department, 54
- Harford, Major H. C., collection of Indian Lepidoptera presented by, 85
- Hargitt, E., Catalogue of Birds, Vol. 18. . 78

- Hartert, E., Catalogue of Birds, Vol. 16..83
 Harting, J. E., engaged as temporary Librarian, 55, 69
 Haslar Hospital collection acquired, 5
 Hemiptera Heteroptera, Catalogue of, by F. Walker, 17, 18
 Henshaw, H. W., 75
Herald, H.M.S., 13
 Heron, F. A., appointment of, 75
 Herrich-Schaeffer, G. A. W., European Lepidoptera purchased, 21
 Heterocera, arranged by Walker, Stephens and Stainton, 8
 ——— *see also* Hampson, Lepidoptera
 Hewitson, W. C., collection of Exotic Butterflies bequeathed by, 46; Catalogue of Collection, 41
 Hispidæ, Catalogue of, by Dr. J. S. Baly, 10
 Hodgson, B. H., Collection of, 14
 ——— Collection, Catalogue of, by Dr. J. E. Gray, 14, 18
 Horn, C., Insects collected in the N.W. Province of India by, acquired, 66
 Hose, Messrs. C. and E., Mammals from Borneo collected by, 95
 Hume, Allan O., ornithological researches in India, 64
 ——— collection of Oriental Birds, etc., 64, 82
 ——— duplicates distributed, 77
 ——— beads and horns of big game presented by, 84
 Humming Birds, Gould Collection of, acquired and exhibited, 45
 ——— Guide to the Gould Collection of, 63, 71
 Hunter, H. C. V., Animals from Kilimandjaro presented by, 75
 Hydrozoa, MS. list of, 94
 Hymenoptera, arranged by F. Smith, 8
- ICHNEUMONIDÆ, list of British, by Th. Desvignes, 11; Desvignes Collection purchased, 21
 Index Museum, 49
 Insects, state of collection in 1856..3
 ——— study-collection, condition in 1856..7
 ——— Gallery in New Museum, 60
 ——— Guide to the Gallery, 63
 ——— Room in New Museum, 61, 73, 74
 Instructions for collecting issued, 84
- JAMES, H. B., collection of Chilian Birds presented by, 85
 Jardine, Sir W., part of his collection of Birds purchased, 70
 Jayakar, Surg.-Maj. A. S. G., Fishes from Muscat presented by, 70
 ——— Mammals from Muscat presented by, 95
 Jeffreys, Dr. J. Gwyn, specimens acquired, 6, 14, 29, 36
 ——— Marine Shells selected by, 66
 Jekel, H., collection of Curculionidæ acquired, 18
 Jerdon, T. C., Indian Reptiles, Batrachians and Fishes, 27, 28
 Johnson, J. Y., collections of, 14
 Johnston, Dr. G., collection of British Zoophytes acquired, 8
 ——— Catalogue of British Non-parasitical Worms, 12, 18
 Johnston, Sir H. H., Animals from Nyassaland presented by, 90, 95
 Jonas, F. M., collection of Lepidoptera from Japan and Formosa acquired, 37
 Jones, Prof. T. Rupert, engaged to revise the Parker Collection of Foraminifera, 83
 Joyner, H. Batson, collections of Marine Animals from Yokohama presented, 36
- KAUP, Dr. J. J., work on Fishes, 10
 Kent, W. Saville; *see* Saville-Kent
 Keyserling, Count, collection of Arachnida purchased, 79
 Kirby, W., Collection of Insects, 14
 Kirby, W. F., appointment of, 41
 ——— duties of, 68
 ——— Catalogue of Hewitson Collection, 41
 Kirk, Sir John, collections formed by, presented, 19
 Kirkpatrick, R., appointment and duties of, 68
 Klunzinger, Dr. C. B., collection of Fishes from the Red Sea, 28
Knight Errant, H.M.S., collections of, 66, 70
Kogia breviceps, skeleton acquired, 27
 Krefft, G., Australian Reptiles presented by, 20
 ——— Fishes from New South Wales obtained from, 28
- LABELS, 49, 67
Lark, H.M.S., collection of, 53
 Leach, Dr. W. E., Systematic Catalogue of Indigenous Mammals and Birds, 11

- Lemur, Ruffed, exhibition of the, 27
- Lemurs, etc., Catalogue of, by Dr. J. E. Gray, 24
- Lepidoptera, Larvæ of British, presented by Lord Walsingham, 70
- Lepidoptera Heterocera, Catalogue of, by F. Walker, 11
- Illustrations of Typical Specimens of, by A. G. Butler, 33, 44, 71, 77; by Lord Walsingham, 44; by G. F. Hampson, 83, 88
- Walker's Types of, 83
- Lepidosiren*, 94, 96
- Library, Zoological, 9, 50, 55, 62, 72, 97
- instituted on larger scale, 40, 50
- Lidderdale, W., collection of Lepidoptera, a selection purchased, 46
- Lidth de Jeude, T. G. Van, collections of, purchased, 19
- Lightning*, H.M.S., collections of, 66
- Lilford, Lord, European Mammals presented by, 95
- Linnean Society of London, collections transferred, 19
- Lithophytes, Catalogue of, by Dr. J. E. Gray, 25
- Littledale, St. George, Animals from the Pamir and Altai Mts., presented by, 75
- Mammals from the Caucasus presented by, 84
- Mammals from Turkestan, 94
- Livingstone Expedition, collections acquired, 19
- Lizards, Catalogue of, by G. A. Boulenger, 64, 70, 71
- Longicornia, Chevrolat Collection of, acquired, 18
- Lord, J. K., collections of, 14, 20
- Low, Sir Hugh, Mammals from N.W. Borneo obtained by, 36
- Lowe, Rev. R. T., collections of, 14, 37
- Lower animals, state of collection in 1856..3
- Lyll, Dr. David, collections of, 13
- MACANDREW, R., specimens acquired, 6
- MacLeay, W. S., types of Insects acquired, 19
- Madeira, Coleoptera of, collected and catalogued by T. Vernon Wollaston, 10, 14
- Madreporarian Corals, Catalogue of, by G. Brook, 88
- MS. list of, 82
- Maidstone Museum, 29
- Mammalia, Guide to the Galleries of, 63, 71
- Mammals, exhibition in 1856..2, 3
- study-series, condition in 1856..4
- arrangement in New Museum, 39, 58
- Handlist of the Edentate, Thick-skinned and Ruminant, by Dr. J. E. Gray, 24
- Large, purchased for the exhibition-series, 53
- Marsupialia and Monotremata, Catalogue of, by Oldfield Thomas, 76, 77
- Mazatlan, Catalogue of the Mollusca of, by Dr. P. P. Carpenter, 10
- Merriam, C. Hart, 75
- Mesoplotodon hectoris*, specimen acquired for exhibition, 67
- Meyer, Dr. A. B., collections from Celebes and the Philippine Islands, 28, 29
- Meyerina*, specimen exhibited, 28
- Microscopic collection arranged, 42
- Miers, E. J., appointment of, 22, 34
- resignation of, 68
- Mintorn, H., assistance in preparation of nesting bird groups, 31
- Mitchell, Capt. Jesse, Fishes of Madras contributed by, 21
- Moggridge, J. Treherne, Trap-door Spiders presented by, 28
- Moggridge, Mrs. E., assistance in preparation of nesting bird groups, 31
- Mollusca, study-series, condition in 1856..5 (see also Shells)
- Monkeys, etc., Catalogue of, by Dr. J. E. Gray, 24
- Monotremata, Catalogue of Marsupialia and, by Oldfield Thomas, 76, 77
- Moore, F., portion of his collection of Indian Lepidoptera purchased, 85
- collections of Indian Butterflies and Moths purchased from, 96
- Morelet, Arthur, collection of Land and Fresh-water Shells purchased, 90
- Mouhot, A. H., collections of, 14, 18, 20
- Murray, A., collections of Insects purchased, 21, 37
- Murray, Sir John, *Challenger* collection, 44, 79
- collections of marine animals from the N.W. coast of Scotland, acquired, 69

- Myriopoda, state of collection in 1856..7
 — Catalogue of, by G. Newport, 7, 10
 — MS. list of, 82, 92
- NASSAU, H.M.S., 19
 Natural History Museum, erection and occupation of new building, 29, 38, 49, 51, 55
 Nematoid Worms, MS. Catalogue of, 42
Neobalæna marginata, specimen acquired for exhibition, 67
 Neuroptera, arranged by F. Walker, 8
 — (Termitina), Catalogue of, by Dr. H. Hagen, 11
 Newbury, R., Buckler Collection of Lepidoptera presented by, 76
 New Museum, *see* Natural History Museum
 Newport, G., Catalogue of Chilopoda by, 7, 10
 New Zealand Institute, Fishes obtained from, 28
 Noctuidæ, arrangement by A. G. Butler, 93
 Nudibranchs, exhibition- and study-series, 31
- OATES, E. W., collection of Birds from Pegu purchased from, 53
 — collection of Burmese Spiders presented by, 92
 Ogilvie-Grant, W. R., appointment of, 51
 — Catalogue of Birds, 83, 88, 95
 — collecting-trip to the Sal-vages, 92, 96
 — Guide to the Gallery of Birds, 31
 Olividæ, List of, by Dr. J. E. Gray, 18
 Orbigny, D', A., Collection acquired, 6
 Ōrley, Dr. L., MS. Catalogue of Nematoid Worms by, 42
 Orthoptera (Phasmidæ), Catalogue of, by Prof. J. O. Westwood, 11
 — Catalogue of, by F. Walker, 17, 18
 O'Shaughnessy, A. W. E., appointment of, 16, 17
 — MS. list of Fishes, 31
 — death of, 41
Osteocella septentrionalis, specimen exhibited, 28
 Osteological Collection, condition in 1856..4
 — Catalogue of, by Edward Gerrard, 16, 18
 — Gallery, 57, 58
- Osteological Collection, Guide to the Gallery, 63
 Owen, Professor [Sir] Richard, 20, 50
- PARK, MUNGO, Sumatran Fishes acquired, 19
 Parker, Prof. W. K., collection of Foraminifera, 83, 86, 88
 Parliamentary Reports, 15, 72
 Parnell, R., collection of Fishes, 5
 Pascoe, F. P., collection of Coleoptera purchased, 89
 Pearl, H.M.S., 35
 Penguin, H.M.S., collections made during the cruises of, presented, 90
 Perry, W. W., 35
 Petherick, Consul J., collections, 14
 Pfeiffer, Dr. L., work upon the Mollusca, 10
Pheronema, specimen exhibited, 28
Physalus latirostris, acquired, 20
 Pierre, L., Mammals from Cochinchina presented by, 36
 Pinwill, Capt. Stackhouse, collections of Oriental Birds and Lepidoptera presented, 37
 Playfair, Col. R. L., Fishes from Zanzibar, etc., collected by, 20
 Plumper, H.M.S., 14
 Pocock, R. I., appointment and duties of, 66, 68
 Polyzoa, Catalogue of Marine, by George Busk, 6, 33
 — MS. list of, 82
Porcupine, H.M.S., collections of, 54, 66
 Portugal, King of, Welwitsch Collections presented by, 36
- QUELCH, J. J., appointment of, 51
 — resignation of, 68
- RAMBLER, H.M.S., 75
 Ramsay, Capt. G. R., Wardlaw, Tweeddale Collection presented by, 70
 Rayner, Dr. F. M., collections of, 13
 Raynor, Dr. G. H., Moths from New South Wales purchased from, 76
 Rein, Dr. J., collection of Fishes from Morocco, 28
 Removal to New Museum, 51, 55
 Reptiles, study-series, condition in 1856..5
 — Exhibition in 1856..2, 3; in New Museum, 59
 — Catalogue of (and Batrachians), by Dr. A. Günther, 10
 — Shield, Catalogue of, by Dr. J. E. Gray, 24

- Reptiles, Handlist of the specimens of, by Dr. J. E. Gray, 24
- Reptiles and Fishes, Guide to the Galleries of, 63, 71
- Rhinoceros simus*, rare southern form of, obtained and exhibited, 94
- *sumatranus*, acquired, 20
- Rhopalocera, arranged by Doubleday and Gray, 8
- Rhynchocephalians, Chelonians and Crocodiles, Catalogue of, by G. A. Boulenger, 77
- Rhynchocha, arranged by Walker and Dallas, 8
- Richardson, Sir John, collection of Fishes, 5
- Ridley, S. O., appointment of, 35
- resignation of, 68
- Riocour, Comte de, collection of Birds purchased, 75
- Roepstorff, F. A. de, Coleoptera from the Andaman and Nicobar Islands, collected by, presented, 65
- Rothschild, Hon. Walter, rare southern form of *Rhinoceros simus* acquired with help of, 94
- Royal Society, collections transferred, 35, 96
- Ruminant Mammalia, Catalogue of, by Dr. J. E. Gray, 24
- Russian Reptiles, Batrachians and Fishes presented by the St. Petersburg Academy of Sciences, 27
- Ruthe, J. F., German Insects collected by, 14
- SAGRA, RAMON DE LA, collection acquired, 6
- St. John, Capt. H. C., collections of marine animals from Japan and Korea, 29, 36
- Salmon, J. K., Mammalia collected in Columbia, by, 27
- Salvadori, Count T., Catalogue of Birds, Vols. 20, 21, 27.. 78, 83, 88, 95
- Salvin, O., Catalogue of Birds, 78, 83, 95
- Salvin, O., and Godman, F. D., collections of (*see* Godman and Salvin)
- Samarang*, H.M.S., collections made during voyage of, 45
- Satyridæ, Catalogue of, by A. G. Butler, 17, 18
- Saunders, Edward, collection of Buprestidæ purchased, 28
- Saunders, Howard, collection of Birds acquired, 82, 85
- Catalogue of Birds, 95
- Saunders, John, Library Attendant, 9, 50
- Saunders, W. Wilson, Neuroptera, Rhynchocha and Diptera presented by, 21
- collection of Moths purchased from, 96
- Saville-Kent, W., Corals collected on the Great Barrier Reef, purchased from, 86
- Corals from N.E. Australia, purchased from, 96
- Schmidt, Prof. Oscar, Adriatic Sponges purchased, 21
- Sclater, P. L., Catalogue of Birds, Vols. 11, 14, 15, 19, by, 71, 77, 78, 83
- Collection of Birds acquired, 65, 70, 76, 79
- Scott-Elliott, G. F., Insects, etc., from Central Africa presented by, 95
- Seals and Whales, Catalogue of, by Dr. J. E. Gray, 24
- Seals, etc., Handlist of, by Dr. J. E. Gray, 24
- Sea-pens, Catalogue of, by Dr. J. E. Gray, 25
- Seba, A., some of his Vertebrates acquired, 19
- Seeböhm, H., Catalogue of Birds, 33, 35, 43, 78
- Collection of Birds acquired, 70, 79, 82, 85
- arrangement of Birds' eggs by, 82
- Shark, Basking, specimen exhibited, 31, 56
- Sharpe, R. Bowdler, appointment of, 22, 34
- Catalogue of Birds, 24, 26, 33, 43, 52, 64, 77, 78, 83, 95
- collection of African Birds purchased, 27, 36
- visit to India, 65
- Shearwater*, H.M.S., Collections of, 66
- Shell and Starfish Galleries, Guide to the, 63, 71
- Shelley, Capt. G. E., Catalogue of Birds, Vol. 19.. 83
- Collection of Birds acquired, 76, 96
- Shells, state of collection in 1856, 2, 3; in New Museum, 60
- Land-, MS. list of, 82
- *see also* Mollusca
- Siebold, Professor C. T. von, collection of Entozoa acquired, 8
- Siemens Bros., Expedition to Amazon River, 93
- Slater, H. H., Expedition to Rodriguez, 35

- Sloane, Sir Hans, directions contained in his Will, 1
- Smith, Sir A., South African Birds presented by, 20
- Smith, E. A., appointment of, 17, 34
— duties of, 23, 68
- Smith, F., Assistant, 9; Assistant Keeper, 34
— employed upon the Hymenoptera, etc., 8, 9
— death of, 41
— Catalogue of Hymenopterous Insects, 13
— Catalogue of British Hymenoptera, 12, 33, 84
— descriptions of New Hymenoptera, 41, 43
— collection of Hymenoptera purchased, 46
- Snakes, Catalogue of, by G. A. Boulenger, 88
- Socotra, animals collected by Prof. I. B. Balfour acquired, 44
- Souleyet, *see* Eydoux
- Spiders of Burma, Descriptive Catalogue of, by T. Thorell, 92, 95
- Spiders, Trap-door, presented and exhibited, 28
- Spirit Building, 39, 59, 62, 73, 74, 81, 86, 87
- Sponges, catalogued by Mr. H. J. Carter, 32
— Deep Sea, collected during the cruise of H.M.S. *Porcupine*, acquired, 54
— MS. list of, 94
- Staff, 9, 17, 22, 34, 41, 51, 66, 68, 75
— recommendations for increase of, 34, 47, 74
- Stanton, H. T., British Heterocera arranged by, 8
— collection of Lepidoptera, drawings, etc., presented, 89; list of contents prepared, 93
- Stantien and Becker, collection of specimens in Amber, 86
- Starfish Gallery, 60; Guide to the Shell and, 63, 71
- Steenstrup, Prof. Japetus, 23
- Steere, Dr. J. B., Birds from the Philippine Islands purchased, 36
- Stephens, J. F., employed upon the British Heterocera, 8
- Students and visitors, 48, 66, 73, 78, 81, 86, 91, 98
- Study-series and exhibition-series, separation of, in 1858..2
- Sulphur, H.M.S., collection made during voyage of, 6, 45
- Swinhoe, Consul R., Birds and Fishes from Formosa and China presented by, 20, 28
- Swinhoe, Consul R., Collection of Birds from Hainan purchased, 27
— of Fishes from China, 28
- Sylvia*, H.M.S. (*see* Wodsworth)
- TATUM, T., collection of Geodephaga acquired, 18
- Taylor, Rev. T. Lombe, Shells presented by, 28
— types of Shells from his collection purchased, 45
- Terror*, H.M.S. (*see* Erebus)
- Theobald, W., Reptiles from Pegu, etc., presented by, 20
- Thomas, M. R. Oldfield, appointment to the Zoological Department, 34
— duties of, 34, 42, 68
— Catalogue of Marsupialia and Monotremata, 67, 76, 77
- Thomson, Prof. Sir Wyville, 54
- Thorell, T., Descriptive Catalogue of the Spiders of Burma, by, 92, 95
- Tortoise, extinct, of Madagascar, exhibited, 94
- Tortoises, Gigantic Land-, Catalogue of, by Dr. A. Günther, 33
- Tortricidæ, North American, presented and worked out by Lord Walsingham, 43; Illustrations of, 44
- Transit of Venus Expedition, large collections dealt with, 32, 35
- Tristram, H. B. [Canon], Collection acquired, 20
- Triton*, H.M.S., Deep-sea Fishes collected by, 70
- Turton, Capt. W. H., marine Shells from St. Helena presented by, 76
- Tweeddale, Marquis of, Collection of Birds and Books, 70
- VARGAS VERGARA, JOSÉ M., Lepidoptera and Coleoptera from Bogotá, presented by, 80
- Verrall, G. H., collection of Diptera presented by, 96
- Vieillot, L. P., Bird types of, purchased, 75
- Vigors, N. A., Insects described by, acquired, 14
- WALKER, F., employment of, 8, 11, 17, 23
— criticism of his work, 8
— Catalogue of Lepidoptera Heterocera (Moths), 11, 18
— Catalogue of Hemiptera Heteroptera, 17, 18, 25
— Catalogue of Orthoptera, 17, 18

- Walker, F., Catalogue of Dermaptera Saltatoria, 25
 ——— List of his Types, 83
 ——— Types (Moths) purchased, 96
 Walker, J. J., collections made in China, Australia, etc., presented, 90
 Wallace, A. R., collections acquired, 14, 18, 20
 ——— collection of Malayan Birds purchased, 27
 ——— Sarawak Lepidoptera purchased, 28
 Walsingham, Lord, assistance in preparation of British Bird-groups, 31
 ——— North American Tortricidæ presented and worked out by, 43, 46; Illustrations of, 44
 ——— collection of mounted larvæ of British Lepidoptera presented by, 70
 ——— collection of mounted larvæ of Indian Moths, presented by, 71
 Walton, J., list of British Curculionidæ, 11
 Warren, W., engaged to arrange the Pyralidæ and Geometridæ, 78
 Waterhouse, C. O., appointment of, 17, 34
 ——— Illustrations of Typical Specimens of Coleoptera—Lycidæ, 43
 Watson, Lieut. E. Y., Lepidoptera from India and Burma presented by, 86
 ——— assistance in arrangement of Butterflies, 92
 Webb, P. B., and Berthelot, S., collection acquired, 6
 Wellington Museum, Cetacea from, 67
 Welwitsch, Dr. F., collections made in Angola presented by the King of Portugal, 36
 Westwood, Prof. J. O., Catalogue of Orthoptera (Phasmidæ), 11
 Whale, specimens acquired, 20
 ——— Sperm, 20, 56
 ——— Piked, acquired, 27
 ——— Antarctic Right, acquired, 27
 ——— Fin-, acquired, 20, 45
 ——— Greenland Right, 56
 ——— remarkable skeletons purchased, 81, 85
 Whale Room, 38, 58, 81, 91
 Whales, etc., Catalogue of, by Dr. J. E. Gray, 24
 ——— see also Cetacea
 Wheelwright, H. W., collection of Swedish Fresh-water Fishes acquired, 20
 White, Adam, Assistant, 9
 ——— employed upon the Crustacea and Insects, 6, 9
 ——— retirement of, 17
 Whitehead, J., Mammals from Borneo and Luzon collected by, 95
 Wodsworth, W. D., collections made during the voyage of H.M.S. *Sylvia*, 53
 Wollaston, T. Vernon, Catalogue of Coleoptera of Madeira, 10; collection acquired, 10, 14
 ——— Catalogue of Coleoptera of the Canaries, 18
 ——— Cape Verde Coleoptera purchased from, 21
 ——— collections of Coleoptera and Lepidoptera from St. Helena acquired, 37, 46
 ——— Land-shells from the Atlantic Islands purchased from, 96
 Worms, exhibition of, in New Museum, 60
 ——— Intestinal, Catalogue of, 8
 Wucherer, Dr. O., Reptiles of Bahia presented by, 20
 XIPHOSURA, state of collection in 1856..7
 YARRELL, W., Collection of Fishes, 5
 Yerbury, Major J. W., Diptera and Neuroptera from Devonshire presented by, 80
 ——— British Diptera presented by, 96
 ——— Mammals from Aden presented by, 95
 ZELLER, Prof. P. C., collection of Lepidoptera purchased, 53
 Zoological Department constituted in 1856..1
 ——— space occupied by, in 1856..2
 Zoological Society, Insect collection presented, 14

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